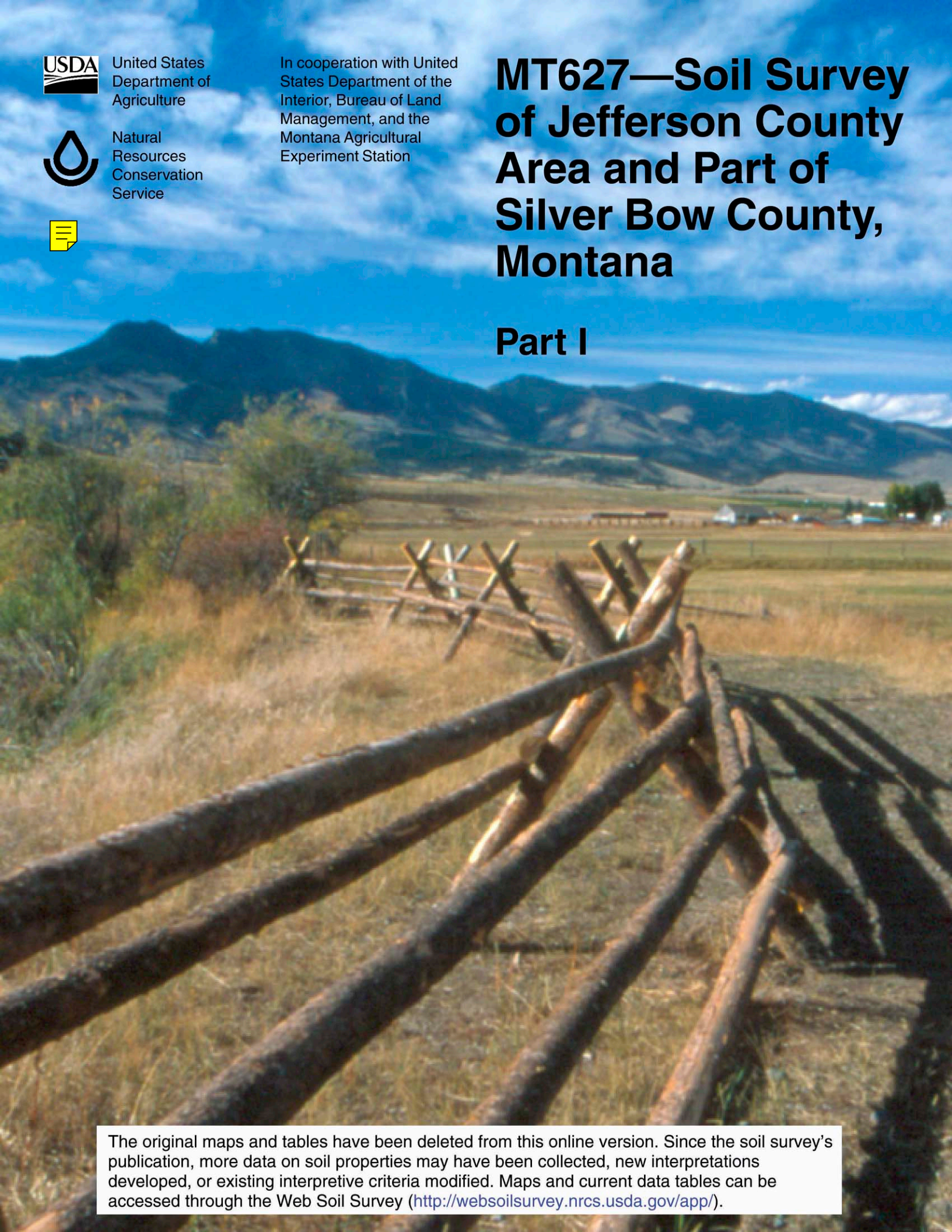
United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with United States Department of the Interior, Bureau of Land Management, and the Montana Agricultural Experiment Station

MT627—Soil Survey of Jefferson County Area and Part of Silver Bow County, Montana

Part I



The original maps and tables have been deleted from this online version. Since the soil survey's publication, more data on soil properties may have been collected, new interpretations developed, or existing interpretive criteria modified. Maps and current data tables can be accessed through the Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/).

How to Use This Soil Survey

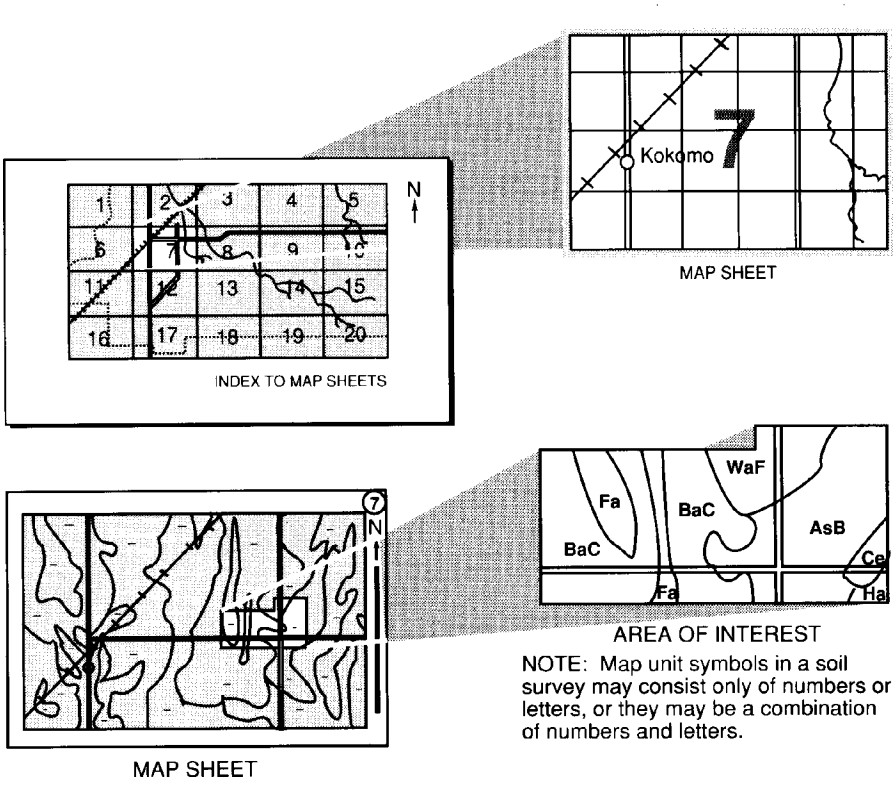
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, you can locate the Section, Township, and Range by zooming in on the **Index to Map Sheets**, or you can go to the Web Soil Survey at (http://websoilsurvey.nrcs.usda.gov/app/).

Note the map unit symbols that are in that area. The **Contents** lists the map units by symbol and name and shows the page where each map unit is described.

See the Contents for sections of this publication that may address your specific needs.



This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1996. Soil names and descriptions were approved in 1998. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1998. This survey was made cooperatively by the Natural Resources Conservation Service; the United States Department of the Interior, Bureau of Land Management; and the Montana Agricultural Experiment Station. It is part of the technical assistance furnished to the Jefferson Valley Conservation District and the Mile High Conservation District.

The most current official data are available through the NRCS Soil Data Mart website at http://soildatamart.nrcs.usda.gov. Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

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Cover: A view of the Boulder River valley. Wetsand soils are in the foreground, and Bull Mountain is in the background.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at http://www.nrcs.usda.gov.

Contents

How To Use This Soil Survey 3
Alphabetical Index to Map Units 27
Foreword 47
How This Survey Was Made 49
General Nature of the Survey Area 50
Physiography, Drainage, and Geology 50
Soil Parent Materials 53
Mineral and Ground-Water Resources 53
Geothermal Resources 54
Seismicity 54
Climate 54
Tables:
Temperature and Precipitation 55
Freeze Dates in Spring and Fall 57
Growing Season 58
Formation and Classification of the Soils 59
Factors of Soil Formation 59
Climate 59
Living Organisms 59
Topography 59
Parent Material 60
Time 60
Classification of the Soils 60
Soil Series and Their Morphology 61
Abor Series 61
Absarook Series 62
Absay Series 63
Adel Series 64
Amesha Series 64
Anamac Series 66
Arrowpeak Family 67
Ashbray Series 67
Attewan Series 68
Baxton Series 69
Beanlake Series 70
Beaverell Series 71
Beenom Series 72
Benz Series 73
Bielenberg Series 74
Bignell Series 75
Blaincreek Series 76
Bobowic Series 77
Bondoe Series 78
Bonebasin Series 79
Branham Series 80
Breeton Series 81
Brickner Series 81
Brocko Series 82
Bronec Series 83
Burtoner Series 85
Cabbart Series 85
Cardwell Series 86
Caseypeak Series 87
Castner Series 88
Catgulch Series 89
Cedric Series 90
Cheadle Series 90
Chinook Series 91
Clancy Series 92
Clasoil Series 93
Clugulch Series 94
Clunton Series 95
Cometcrik Series 96
Connieo Series 97
Cowood Family 98
Cozberg Series 98
Crackerville Series 100
Crago Series 100
Crampton Series 102
Delpoint Series 103
Devilfence Series 103
Deville Series 104
Dougcliff Series 105
Eagleton Series 106
Ellena Series 107
Elmark Series 108
Elve Series 109
Elvick Series 110
Ethridge Series 111
Fairway Series 112
Faith Series 113
Farnuf Series 115
Ferball Series 116
Firada Series 117
Floweree Series 118
Foolhen Series 118
Franconi Series 120
Geohrock Series 121
Gnojek Series 122
Handke Series 123

Hanson Series 124
Hapgood Family 125
Havre Series 125
Haxby Series 126
Helmville Family 127
Hilger Series 128
Hiore Series 129
Holter Series 130
Hoyt Series 131
Jeffcity Series 132
Judco Series 133
Judell Series 134
Kadygulch Series 135
Kalsted Series 136
Kellygulch Series 137
Kimpton Series 138
Kobarter Series 139
Kokoruda Series 140
Kounter Series 141
Kurrie Series 142
Lahood Series 143
Lap Series 144
Ledger Series 145
Libeg Series 146
Lowder Series 147
Lowland Series 148
Lumpgulch Series 149
Macabre Series 150
Maiden Series 151
Marcel Series 152
Martinsdale Series 153
Mckenton Series 154
Meadowcreek Series 156
Mocmont Series 157
Moltoner Series 158
Monaberg Series 159
Mooseflat Series 160
Musselshell Series 161
Nestley Series 162
Nieman Series 163
Nippt Series 164
Nivean Series 165
Opitz Series 165
Peeler Family 167
Pensore Series 168
Perma Series 168
Pieriver Series 169
Placerton Series 170
Quaint Series 171
Quincreek Series 172
Raghorn Series 173
Ratiopeak Series 174
Raynesford Series 175
Redfern Series 176
Redfist Series 177
Releep Series 178
Rencot Series 179
Repkie Series 180
Riverrun Series 181
Rivra Series 182
Roegulch Series 183
Rothiemay Series 184
Roto Series 184
Rubick Series 185
Ryell Series 186
Sappington Series 187
Sawbuck Series 188
Sawicki Series 189
Sebud Series 191
Shaboom Series 192
Shawmut Series 192
Shoddy Series 194
Sieben Series 194
Sieberell Series 196
Sigbird Series 197
Silverchief Family 197
Sixbeacon Series 199
Skyview Series 200
Stemple Family 201
Surdal Series 202
Tepecreek Series 203
Tiban Series 204
Tibkey Series 205
Tigeron Family 206
Tineman Series 207
Tolbert Series 208
Torpy Series 209
Tropal Series 210
Trudau Series 210
Tuggle Series 211

Udecide Series 212
Varney Series 213
Vendome Series 215
Vigilante Series 216
Villy Series 217
Vitroff Series 217
Walbert Series 219
Warneke Series 219
Warwood Family 220
Watne Series 221
Wetsand Series 222
Whitecow Series 224
Whitlash Series 225
Whitore Series 225
Wickes Series 226
Wilde Series 227
Wilspring Series 228
Wimper Series 229
Windham Series 230
Work Series 231
Worock Family 233
Yetull Series 234
Ymark Series 234
Yreka Series 235
Zatony Series 237
Zbart Series 238
Detailed Soil Map Units 267
1—Riverwash 268
2—Rubble land-Rock outcrop association 268
3—Dumps, mine 268
4—Bronec, Clunton, channeled, and Amesha soils, 0 to 8 percent slopes 269
5—Borrow areas and gravel pits 269
6—Wetsand, Cardwell, and Clunton soils, 0 to 2 percent slopes, channeled 270
9—Bronec, Riverrun, channeled, and Amesha soils, 0 to 8 percent slopes 270
11B—Amesha silt loam, 1 to 4 percent slopes 271
11C—Amesha silt loam, 4 to 8 percent slopes 271
11D—Amesha silt loam, 8 to 15 percent slopes 272
13A—Anamac loam, 0 to 2 percent slopes 272
13C—Anamac loam, 2 to 8 percent slopes 272
18A—Brocko silt loam, 0 to 2 percent slopes 273
18C—Brocko silt loam, 2 to 8 percent slopes 273
18D—Brocko silt loam, 8 to 15 percent slopes 273
18E—Brocko silt loam, 15 to 35 percent slopes 274
20C—Windham gravelly loam, 2 to 8 percent slopes 274
20D—Windham gravelly loam, 8 to 15 percent slopes 274
20E—Windham very gravelly loam, 15 to 35 percent slopes 275
21A—Mckenton silty clay loam, 0 to 2 percent slopes 275
22C—Zatony clay loam, 2 to 8 percent slopes 275
23A—Mckenton silt loam, 0 to 2 percent slopes 276
25C—Cozberg sandy loam, 2 to 8 percent slopes 276
26C—Crago gravelly loam, 2 to 8 percent slopes 276
26D—Crago gravelly loam, 8 to 15 percent slopes 277
26E—Crago gravelly loam, 15 to 25 percent slopes 277
27A—Bronec gravelly loam, 0 to 2 percent slopes 278
27C—Bronec gravelly loam, 2 to 8 percent slopes 278
27D—Bronec gravelly loam, 8 to 15 percent slopes 278
27E—Bronec gravelly loam, 15 to 35 percent slopes 279
30A—Dougcliff mucky peat, 0 to 1 percent slopes 279
32A—Fairway silt loam, 0 to 2 percent slopes 279
33E—Geohrock cobbly clay loam, 15 to 35 percent slopes, stony 280

37A—Pieriver silt loam, 0 to 2 percent slopes 280
38C—Kalsted sandy loam, 2 to 8 percent slopes 281
38D—Kalsted sandy loam, 8 to 15 percent slopes 281
40A—Moltoner loam, 0 to 2 percent slopes 281
41—Bronec, Amesha, and Riverrun, channeled, soils, 0 to 35 percent slopes 282
42D—Perma cobbly loam, 4 to 15 percent slopes, stony 282
42E—Perma cobbly loam, 15 to 25 percent slopes, stony 283
47A—Cardwell silty clay loam, 0 to 2 percent slopes 283
48A—Riverrun sandy loam, 0 to 2 percent slopes 283
52A—Ryell loam, 0 to 2 percent slopes 284
53C—Sappington gravelly clay loam, 2 to 8 percent slopes 284
56A—Trudau loam, 0 to 2 percent slopes 284
56B—Trudau loam, 2 to 8 percent slopes 285
60C—Watne loam, 2 to 8 percent slopes 285
64A—Varney sandy clay loam, 0 to 2 percent slopes 286
64C—Varney sandy clay loam, 2 to 8 percent slopes 286
65C—Judell loam, 2 to 8 percent slopes 286
68D—Bondoe channery loam, 4 to 15 percent slopes 287
69A—Meadowcreek silty clay loam, 0 to 2 percent slopes 287
71C—Raghorn sandy loam, 4 to 8 percent slopes 287
71D—Raghorn sandy loam, 8 to 15 percent slopes 288
72F—Zbart-Rock outcrop association, 25 to 70 percent slopes 288
73C—Martinsdale loam, 2 to 8 percent slopes 288
74D—Shawmut gravelly loam, 4 to 15 percent slopes, bouldery 289
75C—Sixbeacon loam, 2 to 8 percent slopes 289
76A—Absay silty clay loam, 0 to 4 percent slopes 289
77F—Rock outcrop-Pensore, stony-Crago, stony, association, 25 to 60 percent slopes 290
79A—Chinook sandy loam, 0 to 2 percent slopes 290
79C—Chinook sandy loam, 2 to 8 percent slopes 291
79D—Chinook sandy loam, 8 to 15 percent slopes 291
79E—Chinook sandy loam, 15 to 25 percent slopes 291
80A—Floweree silt loam, 0 to 2 percent slopes 292
80C—Floweree silt loam, 2 to 8 percent slopes 292
81A—Ethridge clay loam, 0 to 2 percent slopes 292
81C—Ethridge clay loam, 2 to 8 percent slopes 293
82C—Rothiemay very gravelly loam, 2 to 8 percent slopes 293
83C—Shoddy silty clay loam, 2 to 8 percent slopes 293
83D—Shoddy silty clay loam, 8 to 15 percent slopes 294
84A—Clunton-Faith-Dougcliff complex, 1 to 4 percent slopes 294
85D—Walbert coarse sandy loam, 4 to 15 percent slopes 295
87C—Kobarter clay loam, 2 to 8 percent slopes 295
87D—Kobarter clay loam, 8 to 15 percent slopes 295
88C—Lahood loam, 2 to 8 percent slopes 296
88D—Lahood loam, 8 to 15 percent slopes 296
92D—Clunton, Cometcrik, and Perma, stony, soils, 0 to 15 percent slopes 297
99D—Libeg gravelly loam, 4 to 15 percent slopes, bouldery 297
99E—Libeg very gravelly loam, 15 to 35 percent slopes, bouldery 298
113C—Amesha-Amesha, stony, complex, 2 to 8 percent slopes 298
113D—Amesha-Amesha, stony, complex, 8 to 15 percent slopes 299

114D—Amesha-Crago-Shoddy complex, 4 to 15 percent slopes 299
114E—Amesha-Crago-Shoddy complex, 15 to 45 percent slopes 300
115A—Amesha gravelly loam, 0 to 2 percent slopes 301
115C—Amesha gravelly loam, 2 to 8 percent slopes 301
115D—Amesha gravelly loam, 8 to 15 percent slopes 301
115E—Amesha gravelly loam, 15 to 35 percent slopes 302
116A—Amesha loam, 0 to 2 percent slopes 302
116C—Amesha loam, 2 to 8 percent slopes 302
116D—Amesha loam, 8 to 15 percent slopes 303
117E—Amesha-Cabbart-Bronec cobbly loams, 4 to 25 percent slopes 303
118C—Amesha cobbly loam, 2 to 8 percent slopes 304
121E—Maiden-Lap-Rock outcrop complex, 15 to 35 percent slopes 304
121F—Maiden-Lap-Rock outcrop complex, 35 to 60 percent slopes 305
122D—Maiden-Lap-Windham complex, 4 to 15 percent slopes 305
122E—Maiden-Lap-Windham complex, 15 to 35 percent slopes 306
122F—Maiden-Lap-Windham complex, 35 to 60 percent slopes 307
123E—Maiden, very stony-Rock outcrop-Lap, very stony, complex, 8 to 35 percent slopes 307
123F—Maiden, very stony-Rock outcrop-Lap, very stony, complex, 35 to 60 percent slopes 308
125D—Maiden-Lap-Windham complex, 4 to 15 percent slopes, warm 309
125E—Maiden-Lap-Windham complex, 15 to 35 percent slopes, warm 309
126F—Maiden, very stony-Rock outcrop-Lap, very stony, complex, 35 to 60 percent slopes, warm 310
132A—Anamac silt loam, 0 to 2 percent slopes, saline 311
151D—Delpoint-Abor complex, 4 to 15 percent slopes 311
171D—Branham-Opitz-Tuggle complex, 2 to 15 percent slopes 312
171E—Branham-Opitz-Tuggle complex, 15 to 35 percent slopes 312
172D—Branham-Clugulch-Rock outcrop complex, 2 to 15 percent slopes 313
172E—Branham-Clugulch-Rock outcrop complex, 15 to 35 percent slopes 314
173F—Branham, stony-Tuggle, very stony-Rock outcrop complex, 35 to 60 percent slopes 314
182D—Brocko-Amesha complex, 4 to 15 percent slopes 315
183E—Brocko-Rock outcrop-Rencot complex, 8 to 35 percent slopes 315
184E—Brocko-Rock outcrop-Bronec, very stony, complex, 15 to 45 percent slopes 316
191C—Cabbart-Shoddy-Amesha complex, 2 to 8 percent slopes 316
191D—Cabbart-Shoddy-Amesha complex, 8 to 15 percent slopes 317
191E—Cabbart-Shoddy-Amesha complex, 15 to 45 percent slopes 318
192C—Cabbart clay loam, 2 to 8 percent slopes 318
193E—Cabbart-Haxby loams, 8 to 45 percent slopes 319
194E—Cabbart-Bronec, stony-Rencot, very stony, complex, 8 to 25 percent slopes 319
195E—Cabbart, very stony-Bronec, stony-Rock outcrop complex, 8 to 35 percent slopes 320
195F—Cabbart, very stony-Rock outcrop-Bronec, very stony, complex, 25 to 60 percent slopes 321
201E—Windham-Rock outcrop-Lap, very stony, complex, 8 to 35 percent slopes 322
201F—Windham, very stony-Rock outcrop-Lap, very stony, complex, 35 to 70 percent slopes 322
202D—Windham-Judell complex, 8 to 15 percent slopes 323

202E—Windham-Judell complex, 15 to 35 percent slopes 323
203D—Windham gravelly loam, 4 to 15 percent slopes, stony 324
203E—Windham gravelly loam, 15 to 35 percent slopes, stony 324
204D—Windham-Maiden-Lap complex, 4 to 15 percent slopes 324
204E—Windham, stony-Maiden, very stony-Lap, very stony, complex, 15 to 35 percent slopes 325
204F—Windham, very stony-Maiden, very stony-Rock outcrop complex, 25 to 60 percent slopes 326
205E—Windham very cobbly loam, 4 to 35 percent slopes, very stony 326
205F—Windham very cobbly loam, 35 to 60 percent slopes, very stony 327
206F—Windham-Windham, stony, complex, 35 to 70 percent slopes 327
207E—Windham, stony-Lap, very stony-Rock outcrop complex, 15 to 35 percent slopes 328
207F—Windham, stony-Lap, very stony-Rock outcrop complex, 35 to 70 percent slopes 328
208D—Windham-Judell gravelly loams, 8 to 25 percent slopes, stony 329
211A—Clunton silty clay loam, 0 to 2 percent slopes 329
221A—Zatony clay loam, 0 to 2 percent slopes, wet 330
231A—Ledger-Moltoner-Mckenton complex, 0 to 2 percent slopes 330
232A—Clunton-Wetsand-Bonebasin complex, 0 to 2 percent slopes 331
233A—Ledger-Wetsand, saline, complex, 0 to 2 percent slopes 331
241E—Whitlash, very stony-Rock outcrop-Perma, stony, complex, 2 to 25 percent slopes 332
241F—Whitlash, very stony-Rock outcrop-Perma, very stony, complex, 25 to 60 percent slopes 333
245E—Tolbert, very stony-Rock outcrop-Absarook, stony, complex, 8 to 35 percent slopes 333
251B—Cozberg sandy loam, 1 to 4 percent slopes, stony 334
251D—Cozberg sandy loam, 4 to 15 percent slopes, stony 334
261D—Crago-Brocko complex, 4 to 15 percent slopes 335
261E—Crago-Brocko complex, 15 to 60 percent slopes 335
263D—Crago-Rock outcrop-Pensore complex, 4 to 25 percent slopes 336
263F—Crago, stony-Rock outcrop-Pensore, stony, complex, 25 to 60 percent slopes 336
264C—Crago-Amesha complex, 2 to 8 percent slopes 337
264D—Crago-Amesha complex, 8 to 15 percent slopes 337
264E—Crago-Amesha complex, 15 to 35 percent slopes 338
264F—Crago-Amesha complex, 35 to 60 percent slopes 338
265B—Crago gravelly loam, 1 to 4 percent slopes, stony 339
265D—Crago gravelly loam, 4 to 15 percent slopes, stony 339
265E—Crago very cobbly loam, 15 to 45 percent slopes, very stony 340
266D—Crago, stony-Crago complex, 4 to 15 percent slopes 340
266E—Crago, stony-Crago complex, 15 to 45 percent slopes 341
267F—Crago, very stony-Pensore, stony-Rock outcrop complex, 25 to 60 percent slopes 341
268C—Crago-Amesha cobbly loams, 2 to 8 percent slopes 342
269D—Crago, very stony, and Crago, rubbly, soils, 2 to 15 percent slopes 342
271C—Bronec-Amesha complex, 2 to 8 percent slopes 343
271D—Bronec-Amesha complex, 8 to 15 percent slopes 344

271E—Bronec-Amesha complex, 15 to 35 percent slopes 344
271F—Bronec-Amesha-Rock outcrop complex, 35 to 60 percent slopes 345
272E—Bronec-Geohrock-Rock outcrop complex, 15 to 45 percent slopes 345
273D—Bronec-Shoddy-Amesha complex, 4 to 15 percent slopes 346
273E—Bronec-Shoddy-Amesha complex, 15 to 35 percent slopes 347
274A—Bronec complex, 0 to 2 percent slopes 347
274C—Bronec complex, 2 to 8 percent slopes 348
274D—Bronec complex, 8 to 15 percent slopes 349
274E—Bronec-Bronec, very stony, complex, 15 to 45 percent slopes 349
275A—Bronec gravelly loam, 1 to 4 percent slopes, stony 350
275D—Bronec very gravelly loam, 4 to 15 percent slopes, very stony 350
275E—Bronec very gravelly loam, 15 to 35 percent slopes, very stony 351
276C—Bronec gravelly loam, 2 to 8 percent slopes, saline 351
277C—Bronec-Amesha cobbly loams, 2 to 8 percent slopes 351
278E—Bronec-Rencot-Rock outcrop complex, 15 to 45 percent slopes 352
291C—Sieben complex, 2 to 8 percent slopes 353
292C—Sieben-Varney cobbly loams, 2 to 8 percent slopes 353
293D—Sieben cobbly loam, 4 to 15 percent slopes, stony 353
294C—Sieben, stony-Sieberell, very stony, complex, 2 to 15 percent slopes 354
295D—Sieben cobbly loam, 4 to 15 percent slopes, bouldery 354
296D—Sieberell-Sieben-Beaverell complex, 4 to 15 percent slopes, stony 355
297D—Sieben, very stony-Sieben, rubbly, complex, 2 to 25 percent slopes 355
297F—Sieben, rubbly-Sieben, very stony, complex, 15 to 60 percent slopes 356
311D—Beenom, stony-Wimper-Whitlash, very stony, complex, 4 to 15 percent slopes 356
311F—Beenom, stony-Wimper-Whitlash, very stony, complex, 15 to 45 percent slopes 357
321A—Fairway-Meadowcreek complex, 0 to 2 percent slopes 358
322A—Fairway loam, 0 to 2 percent slopes 358
323A—Fairway-Mckenton silt loams, 0 to 2 percent slopes 359
324A—Fairway clay loam, 0 to 2 percent slopes 359
325A—Fairway-Nestley clay loams, 0 to 2 percent slopes 359
326A—Fairway-Moltoner complex, 0 to 2 percent slopes 360
327A—Faith loam, 0 to 2 percent slopes 360
328A—Faith loam, 0 to 2 percent slopes, cool 361
329C—Faith-Slickens complex, 0 to 8 percent slopes, impacted 361
331C—Geohrock-Bronec gravelly loams, 2 to 8 percent slopes 362
331D—Geohrock-Bronec gravelly loams, 8 to 15 percent slopes 362
332D—Geohrock-Sappington complex, 4 to 15 percent slopes, stony 363
334D—Geohrock, stony-Bronec, very stony, complex, 4 to 15 percent slopes 363
341A—Pieriver-Cardwell-Riverrun loams, 0 to 2 percent slopes 364
342A—Handke fine sandy loam, 0 to 2 percent slopes 364
361D—Udecide-Varney-Walbert complex, 4 to 25 percent slopes 365
362C—Udecide-Varney sandy clay loams, 2 to 8 percent slopes 365
371A—Havre-Ryell-Handke complex, 0 to 2 percent slopes 366
372A—Havre loam, 0 to 2 percent slopes 367

381C—Kalsted gravelly sandy loam, 2 to 8 percent slopes 367
382D—Kalsted gravelly sandy loam, 4 to 15 percent slopes, stony 367
391C—Musselshell-Crago gravelly loams, 2 to 8 percent slopes 368
394B—Musselshell-Crago cobbly loams, 1 to 4 percent slopes 368
401A—Moltoner silty clay loam, 0 to 2 percent slopes 369
411A—Nestley loam, 0 to 2 percent slopes 369
413A—Nestley-Riverrun-Pieriver complex, 0 to 2 percent slopes 369
421E—Perma, stony-Whitlash, very stony, complex, 15 to 35 percent slopes 370
421F—Perma-Whitlash complex, 35 to 60 percent slopes, very stony 371
422F—Perma, very stony-Whitlash, very stony-Rock outcrop complex, 15 to 45 percent slopes, moist 371
423C—Wimper loam, 2 to 8 percent slopes 372
423D—Wimper loam, 8 to 15 percent slopes 372
423E—Wimper loam, 15 to 35 percent slopes 373
424D—Wimper-Wimper, stony, complex, 4 to 15 percent slopes 373
424E—Wimper-Wimper, stony, complex, 15 to 35 percent slopes 374
425E—Wimper gravelly loam, 8 to 35 percent slopes, stony 374
426F—Wimper-Whitlash association, 35 to 60 percent slopes 375
427E—Perma-Whitlash complex, 15 to 35 percent slopes, bouldery 375
429E—Perma, very stony-Perma, rubbly-Rock outcrop complex, 8 to 35 percent slopes 376
441F—Warneke-Warneke, very stony-Rock outcrop association, 8 to 60 percent slopes 376
451A—Geohrock cobbly clay loam, 1 to 4 percent slopes, stony 377
461D—Absarook-Beenom complex, 2 to 15 percent slopes 377
471A—Cardwell-Pieriver complex, 0 to 2 percent slopes 378
481A—Riverrun gravelly sandy loam, 0 to 2 percent slopes 378
482A—Riverrun-Cardwell complex, 0 to 2 percent slopes 379
483A—Riverrun, Handke, and Ryell soils, 0 to 2 percent slopes, channeled 379
492D—Roto-Pensore-Crago complex, 4 to 15 percent slopes 380
492E—Roto-Pensore-Crago complex, 15 to 35 percent slopes 380
492F—Roto-Pensore-Crago complex, 35 to 60 percent slopes, stony 381
493D—Pensore-Rock outcrop-Roto complex, 2 to 25 percent slopes 382
511C—Haxby-Amesha-Rencot complex, 4 to 15 percent slopes 382
521A—Cardwell-Riverrun complex, 0 to 2 percent slopes 383
522A—Ryell-Riverrun complex, 0 to 2 percent slopes 384
523A—Cardwell-Riverrun-Pieriver complex, 0 to 2 percent slopes 384
524A—Cardwell loam, 0 to 2 percent slopes 385
525A—Cardwell-Riverrun complex, 0 to 2 percent slopes, saline 385
531C—Sappington very cobbly clay loam, 2 to 8 percent slopes 386
532C—Sappington-Amesha complex, 2 to 8 percent slopes 386
533A—Sappington clay loam, 0 to 2 percent slopes 386
533C—Sappington clay loam, 2 to 8 percent slopes 387
533D—Sappington clay loam, 8 to 15 percent slopes 387
534C—Sappington-Geohrock complex, 2 to 8 percent slopes 387
534D—Sappington-Geohrock complex, 8 to 15 percent slopes 388
536A—Sappington-Amesha complex, 0 to 2 percent slopes 388

537B—Sappington loam, 1 to 4 percent slopes, stony 389
537D—Sappington loam, 4 to 15 percent slopes, stony 389
538C—Sappington gravelly loam, 2 to 8 percent slopes 390
539B—Sappington-Amesha complex, 2 to 8 percent slopes, cobbly 390
539C—Sappington-Amesha complex, 2 to 8 percent slopes, stony 391
541D—Whitlash, very stony-Brickner, stony-Rock outcrop complex, 4 to 25 percent slopes 391
541E—Whitlash, very stony-Brickner, stony-Rock outcrop complex, 25 to 60 percent slopes 392
551E—Brickner, stony-Whitlash, very stony-Rock outcrop complex, 35 to 60 percent slopes 392
552F—Brickner, very bouldery-Rock outcrop-Tolbert, very bouldery, association, 25 to 60 percent slopes 393
553F—Brickner, very stony-Wickes, very bouldery-Rock outcrop complex, 15 to 60 percent slopes 394
554F—Brickner, very stony-Rock outcrop-Mocmont, stony, complex, 25 to 60 percent slopes 394
562C—Trudau-Bronec, saline, complex, 2 to 8 percent slopes 395
564C—Trudau-Benz clay loams, 2 to 8 percent slopes 395
581E—Whitecow, stony-Warneke, very stony-Rock outcrop complex, 8 to 35 percent slopes 396
581F—Whitecow, very stony-Warneke, very stony-Rock outcrop complex, 35 to 70 percent slopes 397
582E—Whitecow, bouldery-Shawmut, very bouldery-Rock outcrop complex, 15 to 45 percent slopes, warm 397
583E—Whitecow-Warneke complex, 8 to 35 percent slopes 398
584F—Whitecow-Whitecow, stony-Warneke complex, 25 to 60 percent slopes 398
585E—Whitecow, bouldery-Shawmut, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 399
591F—Windham-Rock outcrop-Warneke complex, 35 to 60 percent slopes 400
631D—Rencot-Rock outcrop-Rencot, stony, complex, 8 to 25 percent slopes 400
631E—Rencot-Rencot, very stony-Rock outcrop complex, 25 to 60 percent slopes 401
631F—Rencot-Bronec-Rock outcrop complex, 35 to 70 percent slopes 401
632C—Rencot-Lahood-Rock outcrop complex, 2 to 8 percent slopes 402
632D—Rencot-Lahood-Rock outcrop complex, 8 to 25 percent slopes 403
632E—Rencot, very stony-Lahood, stony-Rock outcrop complex, 25 to 45 percent slopes 403
633D—Rencot, very stony-Bronec, very stony-Rock outcrop complex, 4 to 25 percent slopes 404
634E—Rencot, very stony-Rock outcrop-Bronec, very stony, complex, 25 to 45 percent slopes 405
641C—Varney gravelly loam, 2 to 8 percent slopes 405
642C—Varney clay loam, 2 to 8 percent slopes 406
642D—Varney clay loam, 8 to 15 percent slopes 406
643A—Varney cobbly loam, 0 to 2 percent slopes 406
643C—Varney cobbly loam, 2 to 8 percent slopes 407
644C—Varney complex, 2 to 15 percent slopes, gullied 407
645B—Varney-Sieben complex, 1 to 4 percent slopes, stony 408
645D—Varney, stony-Sieben, very stony, complex, 4 to 15 percent slopes 408
645E—Varney, stony-Sieben, very stony, complex, 15 to 35 percent slopes 409
646C—Varney loam, 2 to 8 percent slopes, stony 410

651C—Judell gravelly loam, 2 to 8 percent slopes 410
652C—Judell cobbly loam, 2 to 8 percent slopes 410
655C—Judell gravelly loam, 2 to 8 percent slopes, warm 411
662B—Judell gravelly loam, 1 to 4 percent slopes, very stony 411
691A—Meadowcreek, Clunton, and Cardwell soils, 0 to 2 percent slopes, channeled 411
692A—Meadowcreek-Nestley-Riverrun complex, 0 to 2 percent slopes 412
713E—Raghorn-Ethridge-Kalsted complex, 15 to 35 percent slopes 413
713F—Raghorn-Ethridge-Kalsted complex, 35 to 70 percent slopes 413
721E—Zbart-Bondoe-Brocko complex, 4 to 25 percent slopes 414
731C—Martinsdale, stony-Martinsdale-Hilger complex, 2 to 8 percent slopes 414
732D—Martinsdale-Shawmut, stony-Martinsdale, bouldery, complex, 4 to 25 percent slopes 415
734D—Martinsdale loam, 4 to 15 percent slopes, very stony 416
735C—Martinsdale-Absarook-Whitlash complex, 2 to 8 percent slopes, stony 416
736C—Martinsdale-Work complex, 2 to 8 percent slopes 417
742E—Shawmut, stony-Martinsdale, very stony, complex, 4 to 25 percent slopes 417
744E—Shawmut, bouldery-Shawmut, stony-Tolbert, bouldery, complex, 15 to 35 percent slopes 418
745D—Shawmut-Wickes-Gnojek complex, 2 to 15 percent slopes, bouldery 419
745E—Shawmut, bouldery-Shawmut, very bouldery-Tolbert, bouldery, complex, 15 to 45 percent slopes, dry 419
746E—Shawmut-Tolbert complex, 8 to 35 percent slopes 420
747E—Shawmut, stony-Tolbert, very stony, complex, 15 to 35 percent slopes 421
748E—Shawmut, stony-Wickes, very stony, complex, 15 to 45 percent slopes 421
751C—Sixbeacon gravelly sandy loam, 2 to 8 percent slopes 422
752B—Sixbeacon-Vendome complex, 1 to 4 percent slopes 422
753C—Sixbeacon-Cozberg complex, 2 to 8 percent slopes 422
754D—Sixbeacon-Cozberg, stony, complex, 4 to 15 percent slopes 423
755A—Vendome very cobbly loam, 0 to 4 percent slopes, very stony 423
773F—Rock outcrop-Pensore association, 15 to 60 percent slopes 424
774F—Rock outcrop-Whitlash, bouldery, association, 35 to 70 percent slopes 424
775F—Rock outcrop-Lap-Lap, very stony, association, 15 to 70 percent slopes 425
776D—Rock outcrop-Devilfence association, 2 to 25 percent slopes 425
777E—Rock outcrop-Clugulch-Bobowic complex, 15 to 35 percent slopes 426
777F—Rock outcrop-Clugulch-Bobowic complex, 35 to 70 percent slopes 426
778E—Rock outcrop-Kounter, very bouldery-Jeffcity, bouldery, complex, 15 to 45 percent slopes 427
781A—Vendome sandy loam, 0 to 8 percent slopes 427
782A—Vendome sandy loam, 0 to 8 percent slopes, stony 428
791C—Chinook sandy clay loam, 2 to 8 percent slopes, saline 428
811C—Ethridge, saline-Zatony clay loams, 2 to 8 percent slopes 428
821C—Rothiemay loam, 2 to 8 percent slopes 429
831E—Shoddy-Cabbart-Kobarter complex, 4 to 25 percent slopes 429
832E—Shoddy-Rock outcrop-Delpoint complex, 2 to 25 percent slopes 430
841A—Clunton loam, 0 to 2 percent slopes 431
851D—Walbert-Shoddy-Cabbart complex, 2 to 15 percent slopes 431
851F—Walbert-Shoddy-Cabbart complex, 15 to 35 percent slopes 432

852C—Walbert sandy clay loam, 4 to 15 percent slopes 432
858E—Yetull-Yetull, stony, complex, 8 to 35 percent slopes 433
859C—Yetull loamy fine sand, 2 to 8 percent slopes 433
872E—Kobarter-Abor, stony, complex, 15 to 35 percent slopes 433
911C—Absarook-Martinsdale, stony, complex, 2 to 8 percent slopes 434
915C—Quincreek channery loam, 2 to 8 percent slopes 434
941E—Tigeron, bouldery-Tigeron, very bouldery, complex, 15 to 45 percent slopes 435
942E—Tigeron extremely gravelly loam, 15 to 35 percent slopes, bouldery 435
943F—Tigeron, stony-Tigeron, very stony, complex, 25 to 60 percent slopes 436
944E—Tigeron, very bouldery-Redfern, bouldery-Rock outcrop complex, 15 to 45 percent slopes, warm 436
945E—Tigeron, very bouldery-Redfern, bouldery-Rock outcrop complex, 15 to 45 percent slopes, dry 437
946F—Tigeron, very stony-Redfern, rubbly-Rock outcrop complex, 25 to 60 percent slopes 438
947F—Tigeron, very stony-Redfern, rubbly-Rock outcrop complex, 25 to 60 percent slopes, dry 438
952F—Redfern, bouldery-Rock outcrop-Tigeron, very bouldery, complex, 25 to 60 percent slopes 439
953F—Redfern, rubbly-Rock outcrop-Rubble land association, 25 to 60 percent slopes 439
954F—Redfern, rubbly-Rock outcrop-Tigeron, very bouldery, complex, 35 to 70 percent slopes 440
963E—Elve-Warwood complex, 15 to 45 percent slopes, stony 440
964E—Elve, very stony-Elve, rubbly-Cowood, rubbly, complex, 15 to 35 percent slopes ... 441
964F—Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes, cool 442
965E—Elve, very stony-Cowood, rubbly, complex, 15 to 35 percent slopes 442
965F—Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes, dry 443
966E—Elve, very stony-Rock outcrop-Rubble land complex, 8 to 35 percent slopes 443
967F—Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes 444
968E—Elve, stony-Worock complex, 15 to 35 percent slopes 444
968F—Elve, stony-Worock complex, 35 to 60 percent slopes 445
969F—Elve, bouldery-Worock-Rock outcrop complex, 35 to 60 percent slopes 445
971F—Cowood, rubbly-Rock outcrop association, 25 to 60 percent slopes 446
972F—Cowood, very bouldery-Kimpton, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 447
973D—Cowood, very stony-Elve, very stony-Rock outcrop complex, 4 to 25 percent slopes 447
982F—Kimpton, very bouldery-Rock outcrop-Tiban, very bouldery, complex, 25 to 50 percent slopes 448
991E—Libeg loam, 15 to 35 percent slopes, bouldery 449
992E—Libeg, very bouldery-Libeg, bouldery-Nieman, bouldery, complex, 15 to 45 percent slopes 449
993D—Ratiopeak-Tiban gravelly loams, 4 to 15 percent slopes, bouldery 450
994E—Libeg, stony-Nieman, bouldery, complex, 15 to 45 percent slopes 450
996D—Libeg-Monaberg gravelly loams, 2 to 15 percent slopes, bouldery 451
997E—Libeg, stony-Monaberg-Adel complex, 15 to 35 percent slopes 451

998E—Libeg-Nieman, stony, complex, 8 to 25 percent slopes 452
999E—Libeg, very stony-Libeg, very bouldery, complex, 4 to 25 percent slopes 453
999F—Libeg, very stony-Libeg, rubbly, association, 25 to 60 percent slopes 453
1003E—Tiban, bouldery-Cheadle, very bouldery, complex, 15 to 35 percent slopes 454
1004E—Tiban, rubbly-Tiban, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 454
1101E—Monaberg, stony-Libeg, bouldery, complex, 15 to 35 percent slopes 455
1102B—Adel-Libeg, stony, complex, 1 to 4 percent slopes 455
1103D—Adel-Libeg complex, 4 to 15 percent slopes, stony 456
1104C—Adel loam, 2 to 8 percent slopes 456
1120E—Quaint channery loam, 8 to 35 percent slopes, very stony 457
1121E—Quaint-Rock outcrop-Redfist complex, 4 to 25 percent slopes 457
1121F—Quaint-Rock outcrop complex, 15 to 45 percent slopes 458
1122D—Quaint-Redfist channery loams, 4 to 15 percent slopes 458
1131C—Redfist-Quaint channery loams, 2 to 8 percent slopes 459
1131D—Redfist-Quaint channery loams, 8 to 15 percent slopes 459
1132D—Redfist, bouldery-Perma, bouldery-Rock outcrop complex, 2 to 35 percent slopes 460
1141D—Devilfence very channery loam, 4 to 15 percent slopes 460
1142E—Devilfence-Rock outcrop-Wilspring complex, 8 to 35 percent slopes 461
1142F—Devilfence-Rock outcrop complex, 35 to 60 percent slopes 461
1143F—Deville-Wilde-Rock outcrop complex, 25 to 60 percent slopes 462
1146E—Deville-Rock outcrop-Wilde complex, 8 to 35 percent slopes 462
1152D—Wilspring-Devilfence complex, 4 to 15 percent slopes 463
1152E—Wilspring-Devilfence-Rock outcrop complex, 15 to 35 percent slopes 464
1153C—Wilspring-Quincreek-Devilfence complex, 2 to 8 percent slopes 464
1154E—Wilde-Deville-Vigilante complex, 8 to 35 percent slopes 465
1154F—Wilde, stony-Vigilante-Deville, very stony, complex, 35 to 70 percent slopes 466
1161E—Yreka, bouldery-Hoyt, bouldery-Shaboom, very bouldery, complex, 15 to 45 percent slopes 466
1162E—Yreka very cobbly loam, 15 to 35 percent slopes, bouldery 467
1163F—Ymark, very bouldery-Elmark, very bouldery-Rock outcrop complex, 25 to 60 percent slopes 467
1164F—Yreka-Brickner, stony, complex, 35 to 70 percent slopes 468
1170E—Whitlash-Whitlash, stony-Rock outcrop complex, 15 to 35 percent slopes 469
1171F—Castner, bouldery-Rock outcrop complex, 25 to 50 percent slopes 469
1172F—Castner, very bouldery-Rock outcrop complex, 35 to 60 percent slopes 470
1180E—Farnuf loam, 15 to 35 percent slopes, stony 470
1182C—Breeton gravelly loam, 2 to 8 percent slopes 471
1191E—Silverchief very cobbly clay loam, 8 to 35 percent slopes, bouldery 471
1210C—Ferball clay loam, 2 to 8 percent slopes 471
1222C—Martinsdale-Martinsdale, stony-Shawmut complex, 2 to 8 percent slopes ... 472
1222E—Martinsdale-Martinsdale, stony-Shawmut complex, 15 to 35 percent slopes 472
1223D—Martinsdale-Shawmut complex, 2 to 15 percent slopes, bouldery 473

1242D—Baxton-Connieo, very bouldery-Rock outcrop complex, 4 to 15 percent slopes, moist 473
1242E—Baxton-Connieo, very bouldery-Rock outcrop complex, 15 to 35 percent slopes, moist 474
1243D—Baxton-Connieo coarse sandy loams, 4 to 15 percent slopes, bouldery 475
1244D—Baxton-Connieo, very bouldery-Rock outcrop complex, 4 to 15 percent slopes 475
1244E—Baxton-Connieo-Rock outcrop complex, 15 to 35 percent slopes 476
1245E—Baxton-Breeton-Connieo complex, 15 to 35 percent slopes 476
1246E—Baxton, stony-Breeton, bouldery-Catgulch, very stony, complex, 15 to 35 percent slopes 477
1247E—Baxton-Kellygulch-Connieo complex, 15 to 45 percent slopes 478
1250C—Work cobbly clay loam, 2 to 8 percent slopes, stony 479
1250E—Work very cobbly clay loam, 8 to 25 percent slopes 479
1271D—Placerton-Farnuf-Connieo complex, 8 to 15 percent slopes 479
1272D—Placerton-Connieo-Jeffcity complex, 4 to 15 percent slopes 480
1273E—Placerton-Farnuf-Breeton complex, 15 to 35 percent slopes 481
1275D—Placerton-Farnuf-Connieo gravelly sandy clay loams, 8 to 15 percent slopes 481
1275E—Placerton-Farnuf-Connieo complex, 15 to 35 percent slopes 482
1276D—Placerton-Connieo-Jeffcity complex, 4 to 15 percent slopes, warm 483
1277C—Placerton-Jeffcity complex, 2 to 8 percent slopes 483
1280D—Crackerville-Catgulch complex, 2 to 15 percent slopes, bouldery 484
1281D—Crackerville-Catgulch, bouldery-Rock outcrop complex, 8 to 25 percent slopes 484
1282D—Crackerville-Bielenberg-Catgulch, bouldery, complex, 8 to 20 percent slopes 485
1283E—Crackerville-Bielenberg-Catgulch, bouldery, complex, 20 to 35 percent slopes 486
1286E—Crackerville-Bielenberg-Catgulch, bouldery, complex, 15 to 35 percent slopes, warm 486
1287E—Clancy, very stony-Crampton, bouldery-Bielenberg, very stony, complex, 15 to 45 percent slopes 487
1321B—Beaverell, very stony-Beaverell-Sieberell, stony, complex, 1 to 4 percent slopes 488
1321D—Beaverell, very stony-Sieberell, stony, complex, 4 to 15 percent slopes 489
1322D—Beaverell, stony-Beaverell, rubbly-Sieberell, stony, complex, 2 to 15 percent slopes 489
1331A—Bonebasin-Wetsand complex, 0 to 2 percent slopes 490
1341D—Windham very gravelly loam, 2 to 15 percent slopes, very stony 490
1342E—Windham-Lap very cobbly loams, 15 to 45 percent slopes, bouldery 491
1343D—Windham-Judell very cobbly loams, 4 to 15 percent slopes, bouldery 491
1351D—Perma stony loam, 2 to 15 percent slopes, very bouldery 492
1352E—Perma-Whitlash complex, 15 to 35 percent slopes, bouldery, warm 492
1353F—Perma, very stony-Whitlash, very stony-Rock outcrop complex, 15 to 45 percent slopes 493
1355D—Wimper-Wimper, stony, complex, 4 to 15 percent slopes, warm 493
1355E—Wimper-Wimper, stony, complex, 15 to 35 percent slopes, warm 494
1356E—Wimper gravelly loam, 8 to 35 percent slopes, stony, moist 495

1357F—Perma, very bouldery-Shaboom, extremely bouldery-Rock outcrop complex, 35 to 60 percent slopes 495
1361E—Lumpgulch, bouldery-Rock outcrop-Elmark, bouldery, complex, 8 to 35 percent slopes 496
1362F—Lumpgulch, bouldery-Rock outcrop complex, 25 to 60 percent slopes 496
1372D—Burtoner-Connieo, bouldery-Rock outcrop complex, 4 to 15 percent slopes 497
1373E—Burtoner-Elmark-Connieo complex, 8 to 25 percent slopes, very bouldery 497
1374D—Burtoner-Clancy-Connieo complex, 4 to 15 percent slopes 498
1375D—Burtoner-Connieo, bouldery-Rock outcrop complex, 4 to 15 percent slopes, warm 499
1375E—Burtoner, very stony-Connieo, bouldery-Rock outcrop complex, 15 to 45 percent slopes 499
1376F—Burtoner, very stony-Connieo, very stony-Rock outcrop complex, 35 to 60 percent slopes 500
1377E—Burtoner, very stony-Crampton, bouldery-Catgulch, bouldery, complex, 15 to 45 percent slopes 500
1378E—Burtoner-Elmark-Shaboom, very bouldery, complex, 15 to 45 percent slopes 501
1381D—Jeffcity, stony-Connieo, stony-Rock outcrop complex, 2 to 15 percent slopes 502
1391B—Bronec fine sandy loam, 1 to 4 percent slopes 503
1451F—Blaincreek, very stony-Sawicki, very stony-Tolbert, very bouldery, complex, 35 to 70 percent slopes 503
1460C—Clasoil loam, 2 to 8 percent slopes 504
1461D—Bielenberg-Burtoner, very stony-Catgulch, bouldery, complex, 8 to 25 percent slopes 504
1540F—Shaboom, extremely bouldery-Rock outcrop-Elmark, very bouldery, association, 35 to 60 percent slopes 505
1541E—Shaboom, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes 505
1542E—Shaboom, very bouldery-Rock outcrop-Kellygulch, very bouldery, complex, 8 to 35 percent slopes 506
1543E—Shaboom, very bouldery-Kellygulch, very bouldery-Rock outcrop complex, 15 to 35 percent slopes 507
1543F—Shaboom, extremely bouldery-Kellygulch, extremely bouldery-Rock outcrop complex, 35 to 60 percent slopes 507
1544E—Shaboom, bouldery-Kellygulch, bouldery-Rock outcrop complex, 8 to 45 percent slopes 508
1563D—Hilger, rubbly-Hilger complex, 8 to 25 percent slopes 509
1564E—Hilger, very stony-Hilger, rubbly-Rock outcrop complex, 8 to 35 percent slopes 509
1591E—Catgulch, bouldery-Crackerville-Rock outcrop complex, 15 to 45 percent slopes 510
1595E—Connieo, bouldery-Crackerville-Rock outcrop complex, 15 to 45 percent slopes 511
1596C—Connieo-Rock outcrop-Placerton complex, 2 to 8 percent slopes 511
1602C—Farnuf-Placerton sandy clay loams, 2 to 8 percent slopes 512
1603C—Farnuf sandy loam, 2 to 8 percent slopes 512
1604D—Farnuf-Farnuf, stony-Burtoner complex, 4 to 15 percent slopes 513
1605C—Farnuf-Placerton sandy clay loams, 2 to 8 percent slopes, warm 513
1606D—Farnuf loam, 2 to 15 percent slopes 514
1607D—Farnuf-Placerton-Martinsdale complex, 4 to 15 percent slopes 514

1621D—Connieo, stony-Baxton, stony-Rock outcrop complex, 2 to 15 percent slopes 515
1621E—Connieo, very stony-Baxton, stony-Rock outcrop complex, 15 to 35 percent slopes 515
1622D—Connieo, moist-Rock outcrop complex, 2 to 15 percent slopes 516
1623D—Connieo-Burtoner complex, 2 to 15 percent slopes 516
1623E—Connieo-Baxton-Rock outcrop complex, 15 to 35 percent slopes 517
1624F—Connieo, very stony-Baxton, bouldery-Rock outcrop complex, 35 to 60 percent slopes 517
1625F—Connieo, extremely bouldery-Rock outcrop-Burtoner, extremely stony, complex, 35 to 60 percent slopes 518
1626D—Connieo, bouldery-Burtoner, bouldery-Rock outcrop complex, 4 to 15 percent slopes 519
1627E—Connieo, very bouldery-Burtoner-Rock outcrop complex, 8 to 35 percent slopes, moist 519
1628D—Connieo, bouldery-Ashbray, very bouldery-Rock outcrop complex, 2 to 15 percent slopes 520
1629C—Connieo-Catgulch-Rock outcrop complex, 2 to 8 percent slopes 520
1640D—Nieman, very stony-Rock outcrop-Libeg, stony, complex, 2 to 15 percent slopes 521
1641E—Nieman, very stony-Rock outcrop-Libeg, bouldery, complex, 15 to 45 percent slopes 522
1641F—Nieman, very stony-Rock outcrop-Libeg, very stony, complex, 45 to 70 percent slopes 522
1642F—Nieman, bouldery-Rock outcrop-Libeg, very bouldery, complex, 25 to 60 percent slopes 523
1643E—Nieman, stony-Libeg complex, 15 to 35 percent slopes 524
1643F—Nieman, stony-Libeg-Rock outcrop complex, 35 to 60 percent slopes 524
1651C—Sawbuck-Sawbuck, very stony-Clasoil complex, 2 to 8 percent slopes 525
1652E—Sawicki-Clasoil complex, 8 to 35 percent slopes, bouldery 525
1654E—Sawicki, stony-Blaincreek-Tolbert, very stony, complex, 15 to 45 percent slopes 526
1655E—Sawicki-Clasoil complex, 8 to 35 percent slopes, bouldery, warm 527
1656E—Sawicki-Bielenberg, very stony-Tolbert, very stony, complex, 15 to 45 percent slopes 527
1657E—Sawicki, very bouldery-Crampton, bouldery-Catgulch, bouldery, complex, 15 to 45 percent slopes 528
1658D—Sawicki, stony-Blaincreek, very stony, complex, 4 to 15 percent slopes 529
1658E—Sawicki, very stony-Blaincreek, very stony-Tolbert, bouldery, complex, 15 to 45 percent slopes 529
1659E—Sawbuck, stony-Sawbuck, bouldery, complex, 15 to 35 percent slopes 530
1661D—Catgulch-Baxton complex, 2 to 15 percent slopes, stony 530
1661E—Catgulch-Baxton complex, 15 to 35 percent slopes, stony 531
1662D—Catgulch, very stony-Rock outcrop-Burtoner complex, 4 to 15 percent slopes 532
1663D—Catgulch, bouldery-Burtoner, bouldery-Rock outcrop complex, 2 to 15 percent slopes 532
1664E—Catgulch, bouldery-Rock outcrop-Ashbray, bouldery, complex, 4 to 35 percent slopes 533
1665F—Catgulch, very bouldery-Rock outcrop-Connieo, very stony, complex, 35 to 60 percent slopes 534
1667E—Catgulch, extremely bouldery-Baxton, extremely bouldery-Burtoner, bouldery, complex, 15 to 35 percent slopes 534
1671E—Tolbert-Blaincreek complex, 8 to 35 percent slopes, warm 535

1672E—Tolbert-Blaincreek complex, 8 to 35 percent slopes 535
1675E—Tolbert, very stony-Blaincreek, stony-Rock outcrop complex, 8 to 35 percent slopes 536
1675F—Tolbert, very stony-Rock outcrop-Blaincreek, very stony, complex, 35 to 60 percent slopes 537
1680D—Raynesford silt loam, 4 to 15 percent slopes 537
1690F—Cheadle, very stony-Rock outcrop-Tiban, bouldery, complex, 15 to 45 percent slopes 538
1721C—Martinsdale loam, 2 to 8 percent slopes, warm 538
1722C—Martinsdale-Martinsdale, stony-Shawmut complex, 2 to 8 percent slopes, warm 539
1722E—Martinsdale-Martinsdale, stony-Shawmut complex, 15 to 35 percent slopes, warm 539
1723D—Martinsdale-Shawmut complex, 2 to 15 percent slopes, bouldery, warm 540
1724D—Martinsdale-Shawmut, stony-Martinsdale, bouldery, complex, 4 to 25 percent slopes, warm 541
1731E—Tepecreek, bouldery-Caseypeak, very bouldery-Rock outcrop complex, 8 to 35 percent slopes 541
1731F—Tepecreek, very bouldery-Caseypeak, rubbly-Rock outcrop complex, 35 to 60 percent slopes 542
1732F—Tepecreek, very bouldery-Caseypeak, very bouldery-Rock outcrop complex, 35 to 60 percent slopes 543
1734F—Hiore, stony-Kurrie, stony-Caseypeak, very stony, complex, 35 to 60 percent slopes 543
1735E—Tepecreek, stony-Caseypeak, very bouldery-Rock outcrop complex, 15 to 35 percent slopes 544
1735F—Tepecreek, stony-Caseypeak, very stony-Rock outcrop complex, 35 to 60 percent slopes 545
1740E—Tropal, bouldery-Hanson, stony-Rock outcrop complex, 8 to 25 percent slopes 545
1741F—Tropal, bouldery-Rock outcrop-Whitore, bouldery, complex, 15 to 45 percent slopes 546
1742F—Tropal, very bouldery-Rock outcrop complex, 25 to 60 percent slopes 547
1750F—Whitore, bouldery-Tropal, very bouldery-Rock outcrop complex, 25 to 45 percent slopes 547
1751F—Whitore, very stony-Tropal, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 548
1752E—Whitore, stony-Helmville, bouldery-Firada, very stony, complex, 15 to 45 percent slopes 548
1753E—Whitore, stony-Tropal, very stony-Firada, very stony, complex, 8 to 35 percent slopes 549
1760E—Hanson, stony-Whitore, bouldery, complex, 8 to 35 percent slopes 550
1770E—Helmville, rubbly-Tiban, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 550
1781E—Firada, stony-Tropal, very stony-Rock outcrop complex, 4 to 25 percent slopes 551
1790F—Sigbird, very bouldery-Sigbird, stony-Rock outcrop complex, 25 to 70 percent slopes 551
1800D—Breeton coarse sandy loam, 4 to 15 percent slopes 552
1802D—Breeton-Baxton-Connieo complex, 4 to 15 percent slopes 552
1803C—Breeton-Cometcrik complex, 2 to 8 percent slopes 553
1810F—Hoyt, very stony-Ymark, bouldery-Shaboom, very bouldery, complex, 25 to 60 percent slopes 554
1821F—Kellygulch, bouldery-Rock outcrop-Bielenberg complex, 35 to 70 percent slopes 554

1822F—Kellygulch, stony-Shaboom, very bouldery-Rock outcrop association, 45 to 75 percent slopes 555
1823E—Kellygulch, stony-Shaboom, very bouldery-Rock outcrop complex, 15 to 35 percent slopes 556
1823F—Kellygulch, stony-Shaboom, very bouldery-Rock outcrop complex, 35 to 60 percent slopes 556
1830E—Clancy-Bielenberg-Breeton complex, 15 to 35 percent slopes 557
1831D—Clancy-Burtoner, bouldery, complex, 4 to 15 percent slopes 558
1832D—Clancy-Burtoner, bouldery-Rock outcrop complex, 4 to 15 percent slopes 558
1833D—Clancy-Connieo complex, 2 to 15 percent slopes 559
1835D—Clancy-Bielenberg-Connieo complex, 4 to 15 percent slopes 559
1836E—Clancy, bouldery-Bielenberg, stony-Catgulch, bouldery, complex, 15 to 45 percent slopes 560
1837E—Clancy-Bielenberg-Connieo complex, 15 to 35 percent slopes 561
1838D—Clancy-Clancy, very stony-Bielenberg complex, 4 to 15 percent slopes 561
1841D—Tuggle-Branham-Rock outcrop complex, 2 to 15 percent slopes 562
1842D—Caseypeak-Branham-Rock outcrop complex, 2 to 15 percent slopes 562
1842E—Caseypeak-Branham-Rock outcrop complex, 15 to 35 percent slopes 563
1842F—Caseypeak, bouldery-Branham, bouldery-Rock outcrop complex, 35 to 60 percent slopes 564
1851D—Branham-Lowder loams, 0 to 8 percent slopes 564
1851E—Branham-Lowder loams, 8 to 25 percent slopes 565
1853D—Branham-Tuggle complex, 2 to 15 percent slopes 565
1853E—Branham-Tuggle complex, 15 to 35 percent slopes 566
1861F—Clugulch-Bobowic-Rock outcrop complex, 35 to 70 percent slopes 566
1871E—Hiore, stony-Rock outcrop complex, 15 to 35 percent slopes 567
1871F—Hiore, stony-Rock outcrop complex, 35 to 70 percent slopes 567
1872E—Hiore-Clugulch-Rock outcrop complex, 15 to 35 percent slopes 568
1872F—Hiore-Clugulch-Rock outcrop complex, 35 to 70 percent slopes 569
1901F—Warwood-Tigeron, very stony-Cowood, very stony, complex, 25 to 60 percent slopes 569
1902D—Warwood, very bouldery-Warwood, very stony-Tigeron, very bouldery, complex, 2 to 15 percent slopes 570
1910F—Elmark, very bouldery-Rock outcrop-Shaboom, extremely bouldery, complex, 25 to 60 percent slopes 571
1921D—Judell-Lap, very stony, complex, 4 to 15 percent slopes 571
1921E—Judell-Lap, very stony, complex, 15 to 35 percent slopes 572
1930E—Elmark-Kellygulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes 572
1933E—Elmark, bouldery-Breeton-Shaboom, bouldery, complex, 15 to 45 percent slopes 573
1940E—Elmark, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes 574
1945E—Elmark, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes, dry 574
1946E—Elmark, bouldery-Hoyt-Shaboom, very bouldery, complex, 8 to 35 percent slopes, dry 575
1947E—Elmark, bouldery-Burtoner-Rock outcrop complex, 8 to 45 percent slopes 576
1948E—Elmark, very bouldery-Skyview, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 576

1950F—Franconi, very bouldery-Warwood-Caseypeak, very bouldery, complex, 25 to 60 percent slopes 577
1960D—Lumpgulch, bouldery-Hoyt-Shaboom, very bouldery, complex, 4 to 15 percent slopes 578
1961E—Lumpgulch, bouldery-Hoyt-Shaboom, very bouldery, complex, 15 to 45 percent slopes 578
1962E—Lumpgulch, bouldery-Yreka, very bouldery-Shaboom, very bouldery, complex, 15 to 35 percent slopes 579
1963F—Lumpgulch, very bouldery-Rock outcrop-Kellygulch, very bouldery, complex, 25 to 60 percent slopes 580
1964E—Lumpgulch, very bouldery-Shaboom, very bouldery-Rock outcrop complex, 8 to 25 percent slopes 581
1965E—Lumpgulch, bouldery-Ymark, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 581
1970E—Bignell, stony-Yreka, very stony, complex, 15 to 35 percent slopes 582
1980F—Stemple cobbly loam, 35 to 60 percent slopes, very stony 582
1990F—Bobowic, very bouldery-Rock outcrop-Tepecreek, very bouldery, complex, 25 to 60 percent slopes 583
1991D—Bobowic-Clugulch, bouldery-Rock outcrop complex, 4 to 25 percent slopes 583
2000E—Skyview, very bouldery-Rock outcrop-Roegulch, very bouldery, complex, 8 to 35 percent slopes 584
2001E—Skyview, very bouldery-Elmark, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 585
2011D—Shawmut gravelly loam, 4 to 15 percent slopes, bouldery, warm 585
2012D—Shawmut, stony-Martinsdale, very stony, complex, 4 to 15 percent slopes, warm 586
2012E—Shawmut, stony-Martinsdale, very stony, complex, 15 to 25 percent slopes, warm 586
2013E—Shawmut, bouldery-Wickes, stony-Tolbert, bouldery, complex, 15 to 35 percent slopes 587
2014E—Shawmut-Tolbert complex, 8 to 35 percent slopes, warm 587
2020D—Shawmut, stony-Shawmut, bouldery, complex, 4 to 15 percent slopes 588
2030E—Kokoruda-Elmark, very bouldery-Rock outcrop complex, 8 to 35 percent slopes 588
2031D—Eagleton, stony-Kokoruda-Cometcrik complex, 2 to 25 percent slopes 589
2040F—Shaboom, extremely bouldery-Rock outcrop-Rubble land association, 35 to 70 percent slopes 590
2041F—Rock outcrop-Catgulch, bouldery, complex, 15 to 70 percent slopes 590
2042F—Rock outcrop-Cheadle, very bouldery-Tiban, very bouldery, complex, 15 to 50 percent slopes 591
2043F—Rencot, very stony-Rencot, bouldery-Rock outcrop association, 15 to 60 percent slopes 591
2045F—Caseypeak, very stony-Rock outcrop-Rubble land association, 15 to 60 percent slopes, dry 592
2046F—Caseypeak, very bouldery-Rock outcrop-Rubble land association, 15 to 60 percent slopes, cool 592
2051E—Opitz, bouldery-Branham, very bouldery-Tuggle, very bouldery, complex, 8 to 35 percent slopes 593
2081F—Windham, very stony-Rock outcrop-Lap, very stony, complex, 35 to 70 percent slopes, warm 594
2082D—Windham-Judell complex, 8 to 15 percent slopes, warm 594
2084E—Windham, stony-Maiden, very stony-Lap, very stony, complex, 15 to 35 percent slopes, warm 595
2086E—Windham-Windham, stony, complex, 15 to 35 percent slopes, warm 595
2088D—Windham-Judell gravelly loams, 8 to 25 percent slopes, stony, warm 596

2090F—Caseypeak, very bouldery-Franconi, very bouldery-Rock outcrop complex, 25 to 60 percent slopes 596
2091E—Caseypeak, bouldery-Franconi, bouldery-Rock outcrop complex, 8 to 35 percent slopes 597
2110D—Sebud very cobbly loam, 4 to 15 percent slopes, very stony 598
2111E—Sebud, very stony-Hapgood complex, 8 to 45 percent slopes 598
2112D—Sebud-Marcel complex, 4 to 25 percent slopes, bouldery 599
2121F—Hapgood-Hanson-Tiban complex, 25 to 60 percent slopes, very stony 599
2122F—Hapgood-Tiban complex, 35 to 70 percent slopes, very stony 600
2123F—Hapgood-Sebud-Arrowpeak complex, 35 to 60 percent slopes, very stony 600
2125F—Cowood, rubbly-Elve, very stony-Rock outcrop complex, 25 to 60 percent slopes 601
2151E—Releep, very bouldery-Kurrie, very bouldery-Rock outcrop complex, 15 to 35 percent slopes 602
2161E—Ellena, bouldery-Worock, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 602
2161F—Kurrie, very bouldery-Ellena, very bouldery-Rock outcrop complex, 25 to 60 percent slopes 603
2171F—Hiore-Kurrie, stony, complex, 25 to 60 percent slopes 604
2172F—Rubick, very stony-Rock outcrop complex, 35 to 60 percent slopes 604
2173F—Rubick gravelly sandy loam, 35 to 60 percent slopes, stony 605
2181F—Repkie, very stony-Yreka, stony-Skyview, very bouldery, complex, 25 to 60 percent slopes 605
2211E—Sebud-Arrowpeak, stony, complex, 8 to 45 percent slopes 606
2211F—Sebud, very stony-Arrowpeak, very stony-Rock outcrop complex, 35 to 60 percent slopes 606
2212D—Sebud, very stony-Libeg-Arrowpeak, stony, complex, 4 to 15 percent slopes 607
2212E—Sebud, very stony-Libeg, stony-Arrowpeak, stony, complex, 15 to 35 percent slopes 607
2213E—Sebud, stony-Surdal, stony-Arrowpeak, very stony, complex, 8 to 35 percent slopes 608
2213F—Sebud, stony-Surdal, stony-Arrowpeak, very stony, complex, 35 to 60 percent slopes 609
2214E—Sebud, bouldery-Surdal, very bouldery-Arrowpeak, very bouldery, complex, 15 to 35 percent slopes 610
2215D—Sebud-Tibkey cobbly loams, 2 to 15 percent slopes, bouldery 610
2216D—Sebud-Surdal complex, 4 to 25 percent slopes, stony 611
2221E—Arrowpeak, very stony-Surdal, stony-Rock outcrop complex, 8 to 35 percent slopes 611
2222F—Arrowpeak, very stony-Sebud, stony-Surdal, very stony, complex, 25 to 60 percent slopes 612
2230B—Tineman cobbly loam, 2 to 8 percent slopes, very stony 613
2251F—Nivean, very stony-Rock outcrop-Rubble land complex, 25 to 60 percent slopes 613
2252E—Nivean, very stony-Macabre, stony-Rock outcrop complex, 15 to 35 percent slopes 614
2261D—Lowland loam, 4 to 15 percent slopes, stony 614
2261E—Lowland loam, 15 to 35 percent slopes, stony 615
2261F—Lowland, stony-Rock outcrop-Rubble land complex, 35 to 60 percent slopes 615
2270F—Macabre, very stony-Rock outcrop-Rubble land complex, 35 to 60 percent slopes 615
2271D—Macabre gravelly loam, 8 to 15 percent slopes 616

2281F—Judco, stony-Torpy, stony-Rock outcrop complex, 35 to 60 percent slopes 616
2291F—Mocmont-Kadygulch cobbly loams, 35 to 60 percent slopes, very stony 617
2301F—Mocmont, bouldery-Roegulch, rubbly-Rock outcrop complex, 25 to 60 percent slopes 618
2311F—Worock, stony-Cowood, very stony-Rock outcrop complex, 35 to 60 percent slopes 618
2312F—Worock, stony-Elve, stony-Rock outcrop complex, 35 to 60 percent slopes 619
2321D—Torpy loam, 4 to 15 percent slopes 619
2321E—Torpy gravelly loam, 15 to 35 percent slopes 620
2321F—Torpy gravelly loam, 35 to 60 percent slopes 620
2322E—Lowland-Torpy complex, 15 to 35 percent slopes 621
2322F—Lowland-Torpy complex, 35 to 60 percent slopes 621
2331B—Mooseflat loam, 1 to 4 percent slopes 622
2332B—Mooseflat-Elvick loams, 1 to 4 percent slopes 622
2350D—Clasoil, very stony-Sawicki, bouldery, complex, 4 to 15 percent slopes 622
2360E—Gnojek, stony-Wickes, stony-Shawmut complex, 8 to 35 percent slopes 623
2360F—Gnojek, stony-Wickes, stony-Rock outcrop complex, 35 to 70 percent slopes 624
2361E—Gnojek, stony-Wickes, stony-Rock outcrop complex, 8 to 35 percent slopes 624
2361F—Gnojek, stony-Rock outcrop-Wickes, stony, complex, 25 to 60 percent slopes 625
2391C—Marcel, very bouldery-Tibkey, bouldery, complex, 2 to 8 percent slopes ... 626
2411E—Ashbray, bouldery-Rock outcrop-Rubble land complex, 8 to 45 percent slopes 626
2412F—Ashbray, rubbly-Rock outcrop-Kellygulch, very stony, complex, 35 to 70 percent slopes 627
2421E—Surdal, stony-Arrowpeak, very stony, complex, 4 to 25 percent slopes 627
2431C—Foolhen, stony-Tibkey, bouldery, complex, 0 to 8 percent slopes 628
2441E—Tineman, very stony-Franconi, bouldery-Rock outcrop complex, 4 to 25 percent slopes 628
2450E—Kounter, bouldery-Rock outcrop-Cedric, bouldery, complex, 8 to 35 percent slopes 629
2451D—Kounter, bouldery-Rock outcrop-Cedric, bouldery, complex, 4 to 25 percent slopes, dry 630
2452E—Kounter, very bouldery-Rock outcrop-Jeffcity, bouldery, complex, 15 to 35 percent slopes 630
2460D—Cedric, bouldery-Jeffcity, bouldery-Rock outcrop complex, 2 to 15 percent slopes 631
2461D—Cedric, bouldery-Rock outcrop-Jeffcity, bouldery, complex, 2 to 15 percent slopes 631
2471F—Elve, stony-Worock, stony-Rock outcrop complex, 35 to 60 percent slopes 632
2472E—Elvick-Lowder complex, 8 to 25 percent slopes, very bouldery 633
2473E—Elve-Cowood very cobbly loams, 8 to 35 percent slopes, very stony 633
2481F—Brickner, very bouldery-Rock outcrop-Rubble land complex, 15 to 60 percent slopes 634
2483F—Elve, rubbly-Rock outcrop-Rubble land association, 25 to 60 percent slopes, cool 634
2484F—Rock outcrop-Rubble land-Redfern, rubbly, association, 35 to 70 percent slopes 635
2485F—Redfern, rubbly-Rock outcrop-Tigeron, very bouldery, association, 25 to 70 percent slopes 635

2486F—Elve, rubbly-Rock outcrop-Rubble land complex, 35 to 60 percent slopes 636
2487F—Torpy, rubbly-Rock outcrop-Rubble land complex, 35 to 60 percent slopes 636
2488D—Elve, very stony-Rock outcrop-Rubble land complex, 4 to 35 percent slopes 637
2501D—Lowder-Elvick very cobbly loams, 2 to 15 percent slopes, very bouldery 637
2511C—Monaberg loam, 2 to 8 percent slopes, bouldery 638
2581E—Worock, very bouldery-Elve, very stony, complex, 15 to 35 percent slopes 638
2582D—Worock-Elve very cobbly loams, 2 to 15 percent slopes, very bouldery, cool 639
2582E—Worock, very bouldery-Worock, rubbly, complex, 8 to 35 percent slopes 639
2582F—Worock, rubbly-Rock outcrop-Rubble land complex, 35 to 60 percent slopes 640
2583D—Worock, stony-Worock, very bouldery, complex, 2 to 15 percent slopes 640
2583F—Worock, very bouldery-Worock, rubbly, complex, 35 to 60 percent slopes ... 641
2584E—Worock, very bouldery-Worock, rubbly, complex, 15 to 45 percent slopes, dry 642
2591F—Kadygulch-Roegulch, stony, complex, 35 to 60 percent slopes 642
2661F—Elve-Cowood complex, 45 to 70 percent slopes 643
2662E—Elve-Cowood complex, 15 to 45 percent slopes 643
2681E—Sawbuck-Catgulch, stony, complex, 8 to 45 percent slopes 644
2682E—Sawbuck, stony-Yreka, stony-Catgulch, very stony, complex, 15 to 45 percent slopes 644
2691F—Connieo, very stony-Crackerville, stony-Rock outcrop complex, 35 to 60 percent slopes 645
2695E—Macabre-Nivean complex, 15 to 35 percent slopes 646
2695F—Macabre-Judco-Rock outcrop complex, 35 to 60 percent slopes 646
2701F—Crampton-Catgulch complex, 35 to 60 percent slopes, very stony 647
2705F—Vitroff-Torpy loams, 35 to 60 percent slopes 647
2711E—Libeg very gravelly loam, 15 to 45 percent slopes 648
2712D—Libeg-Mooseflat loams, 4 to 25 percent slopes 648
3001B—Aridic Ustifluvents, 0 to 4 percent slopes 649
3033B—Sappington-Amesha loams, 1 to 4 percent slopes 649
3033C—Sappington-Amesha loams, 4 to 8 percent slopes 649
3061E—Holter-Castner channery loams, 8 to 45 percent slopes 650
3064D—Windham channery loam, 4 to 15 percent slopes 650
3137B—Musselshell-Crago complex, 2 to 8 percent slopes 651
3141E—Crago-Pensore channery loams, 15 to 45 percent slopes 651
3218A—Meadowcreek-Fairway complex, 0 to 2 percent slopes 652
3233C—Geohrock-Crago very cobbly loams, 2 to 8 percent slopes 652
3433E—Crago-Musselshell gravelly loams, 4 to 35 percent slopes 653
3486F—Peeler-Rock outcrop complex, 15 to 60 percent slopes 653
3501B—Fluvaquents-Fluvaquentic Haplustolls complex, 0 to 4 percent slopes 654
3513A—Attewan-Nippt complex, 0 to 2 percent slopes 654
3532B—Geohrock gravelly loam, 2 to 8 percent slopes 655
3664E—Windham-Whitecow-Lap channery loams, 15 to 45 percent slopes 655
3685F—Whitecow channery loam, 25 to 60 percent slopes 656
3885F—Whitecow-Warneke channery loams, 15 to 45 percent slopes 656
DAM—Dam 656

M-W—Miscellaneous water 657
W—Water 657
References 659
Glossary 661

Issued 2003

For tables with the most current data, please visit the Soil Data Mart at **http://soildatamart.nrcs.usda.gov/.**

Alphabetical Index to Map Units

461D—Absarook-Beenom complex, 2 to 15 percent slopes 377
911C—Absarook-Martinsdale, stony, complex, 2 to 8 percent slopes 434
76A—Absay silty clay loam, 0 to 4 percent slopes 289
1104C—Adel loam, 2 to 8 percent slopes 456
1103D—Adel-Libeg complex, 4 to 15 percent slopes, stony 456
1102B—Adel-Libeg, stony, complex, 1 to 4 percent slopes 455
118C—Amesha cobbly loam, 2 to 8 percent slopes 304
115A—Amesha gravelly loam, 0 to 2 percent slopes 301
115C—Amesha gravelly loam, 2 to 8 percent slopes 301
115D—Amesha gravelly loam, 8 to 15 percent slopes 301
115E—Amesha gravelly loam, 15 to 35 percent slopes 302
116A—Amesha loam, 0 to 2 percent slopes 302
116C—Amesha loam, 2 to 8 percent slopes 302
116D—Amesha loam, 8 to 15 percent slopes 303
11B—Amesha silt loam, 1 to 4 percent slopes 271
11C—Amesha silt loam, 4 to 8 percent slopes 271
11D—Amesha silt loam, 8 to 15 percent slopes 272
113C—Amesha-Amesha, stony, complex, 2 to 8 percent slopes 298
113D—Amesha-Amesha, stony, complex, 8 to 15 percent slopes 299
117E—Amesha-Cabbart-Bronec cobbly loams, 4 to 25 percent slopes 303
114D—Amesha-Crago-Shoddy complex, 4 to 15 percent slopes 299
114E—Amesha-Crago-Shoddy complex, 15 to 45 percent slopes 300
13A—Anamac loam, 0 to 2 percent slopes 272
13C—Anamac loam, 2 to 8 percent slopes 272
132A—Anamac silt loam, 0 to 2 percent slopes, saline 311
3001B—Aridic Ustifluvents, 0 to 4 percent slopes 649
2222F—Arrowpeak, very stony-Sebud, stony-Surdal, very stony, complex, 25 to 60 percent slopes 612
2221E—Arrowpeak, very stony-Surdal, stony-Rock outcrop complex, 8 to 35 percent slopes 611
2411E—Ashbray, bouldery-Rock outcrop-Rubble land complex, 8 to 45 percent slopes 626
2412F—Ashbray, rubbly-Rock outcrop-Kellygulch, very stony, complex, 35 to 70 percent slopes 627
3513A—Attewan-Nippt complex, 0 to 2 percent slopes 654
1246E—Baxton, stony-Breeton, bouldery-Catgulch, very stony, complex, 15 to 35 percent slopes 477
1245E—Baxton-Breeton-Connieo complex, 15 to 35 percent slopes 476
1243D—Baxton-Connieo coarse sandy loams, 4 to 15 percent slopes, bouldery 475
1244E—Baxton-Connieo-Rock outcrop complex, 15 to 35 percent slopes 476
1244D—Baxton-Connieo, very bouldery-Rock outcrop complex, 4 to 15 percent slopes 475
1242D—Baxton-Connieo, very bouldery-Rock outcrop complex, 4 to 15 percent slopes, moist 473
1242E—Baxton-Connieo, very bouldery-Rock outcrop complex, 15 to 35 percent slopes, moist 474
1247E—Baxton-Kellygulch-Connieo complex, 15 to 45 percent slopes 478
1322D—Beaverell, stony-Beaverell, rubbly-Sieberell, stony, complex, 2 to 15 percent slopes 489
1321B—Beaverell, very stony-Beaverell-Sieberell, stony, complex, 1 to 4 percent slopes 488
1321D—Beaverell, very stony-Sieberell, stony, complex, 4 to 15 percent slopes 489

311D—Beenom, stony-Wimper-Whitlash, very stony, complex, 4 to 15 percent slopes 356
311F—Beenom, stony-Wimper-Whitlash, very stony, complex, 15 to 45 percent slopes 357
1461D—Bielenberg-Burtoner, very stony-Catgulch, bouldery, complex, 8 to 25 percent slopes 504
1970E—Bignell, stony-Yreka, very stony, complex, 15 to 35 percent slopes 582
1451F—Blaincreek, very stony-Sawicki, very stony-Tolbert, very bouldery, complex, 35 to 70 percent slopes 503
1990F—Bobowic, very bouldery-Rock outcrop-Tepecreek, very bouldery, complex, 25 to 60 percent slopes 583
1991D—Bobowic-Clugulch, bouldery-Rock outcrop complex, 4 to 25 percent slopes 583
68D—Bondoe channery loam, 4 to 15 percent slopes 287
1331A—Bonebasin-Wetsand complex, 0 to 2 percent slopes 490
5—Borrow areas and gravel pits 269
173F—Branham, stony-Tuggle, very stony-Rock outcrop complex, 35 to 60 percent slopes 314
172D—Branham-Clugulch-Rock outcrop complex, 2 to 15 percent slopes 313
172E—Branham-Clugulch-Rock outcrop complex, 15 to 35 percent slopes 314
1851D—Branham-Lowder loams, 0 to 8 percent slopes 564
1851E—Branham-Lowder loams, 8 to 25 percent slopes 565
171D—Branham-Opitz-Tuggle complex, 2 to 15 percent slopes 312
171E—Branham-Opitz-Tuggle complex, 15 to 35 percent slopes 312
1853D—Branham-Tuggle complex, 2 to 15 percent slopes 565
1853E—Branham-Tuggle complex, 15 to 35 percent slopes 566
1800D—Breeton coarse sandy loam, 4 to 15 percent slopes 552
1182C—Breeton gravelly loam, 2 to 8 percent slopes 471
1802D—Breeton-Baxton-Connieo complex, 4 to 15 percent slopes 552
1803C—Breeton-Cometcrik complex, 2 to 8 percent slopes 553
551E—Brickner, stony-Whitlash, very stony-Rock outcrop complex, 35 to 60 percent slopes 392
2481F—Brickner, very bouldery-Rock outcrop-Rubble land complex, 15 to 60 percent slopes 634
552F—Brickner, very bouldery-Rock outcrop-Tolbert, very bouldery, association, 25 to 60 percent slopes 393
554F—Brickner, very stony-Rock outcrop-Mocmont, stony, complex, 25 to 60 percent slopes 394
553F—Brickner, very stony-Wickes, very bouldery-Rock outcrop complex, 15 to 60 percent slopes 394
18A—Brocko silt loam, 0 to 2 percent slopes 273
18C—Brocko silt loam, 2 to 8 percent slopes 273
18D—Brocko silt loam, 8 to 15 percent slopes 273
18E—Brocko silt loam, 15 to 35 percent slopes 274
182D—Brocko-Amesha complex, 4 to 15 percent slopes 315
184E—Brocko-Rock outcrop-Bronec, very stony, complex, 15 to 45 percent slopes 316
183E—Brocko-Rock outcrop-Rencot complex, 8 to 35 percent slopes 315
274A—Bronec complex, 0 to 2 percent slopes 347
274C—Bronec complex, 2 to 8 percent slopes 348
274D—Bronec complex, 8 to 15 percent slopes 349
1391B—Bronec fine sandy loam, 1 to 4 percent slopes 503
27A—Bronec gravelly loam, 0 to 2 percent slopes 278
275A—Bronec gravelly loam, 1 to 4 percent slopes, stony 350

27C—Bronec gravelly loam, 2 to 8 percent slopes 278
27D—Bronec gravelly loam, 8 to 15 percent slopes 278
27E—Bronec gravelly loam, 15 to 35 percent slopes 279
276C—Bronec gravelly loam, 2 to 8 percent slopes, saline 351
275D—Bronec very gravelly loam, 4 to 15 percent slopes, very stony 350
275E—Bronec very gravelly loam, 15 to 35 percent slopes, very stony 351
41—Bronec, Amesha, and Riverrun, channeled, soils, 0 to 35 percent slopes 282
4—Bronec, Clunton, channeled, and Amesha soils, 0 to 8 percent slopes 269
9—Bronec, Riverrun, channeled, and Amesha soils, 0 to 8 percent slopes 270
277C—Bronec-Amesha cobbly loams, 2 to 8 percent slopes 351
271C—Bronec-Amesha complex, 2 to 8 percent slopes 343
271D—Bronec-Amesha complex, 8 to 15 percent slopes 344
271E—Bronec-Amesha complex, 15 to 35 percent slopes 344
271F—Bronec-Amesha-Rock outcrop complex, 35 to 60 percent slopes 345
274E—Bronec-Bronec, very stony, complex, 15 to 45 percent slopes 349
272E—Bronec-Geohrock-Rock outcrop complex, 15 to 45 percent slopes 345
278E—Bronec-Rencot-Rock outcrop complex, 15 to 45 percent slopes 352
273E—Bronec-Shoddy-Amesha complex, 15 to 35 percent slopes 347
273D—Bronec-Shoddy-Amesha complex, 4 to 15 percent slopes 346
1375E—Burtoner, very stony-Connieo, bouldery-Rock outcrop complex, 15 to 45 percent slopes 499
1376F—Burtoner, very stony-Connieo, very stony-Rock outcrop complex, 35 to 60 percent slopes 500
1377E—Burtoner, very stony-Crampton, bouldery-Catgulch, bouldery, complex, 15 to 45 percent slopes 500
1374D—Burtoner-Clancy-Connieo complex, 4 to 15 percent slopes 498
1372D—Burtoner-Connieo, bouldery-Rock outcrop complex, 4 to 15 percent slopes 497
1375D—Burtoner-Connieo, bouldery-Rock outcrop complex, 4 to 15 percent slopes, warm 499
1373E—Burtoner-Elmark-Connieo complex, 8 to 25 percent slopes, very bouldery 497
1378E—Burtoner-Elmark-Shaboom, very bouldery, complex, 15 to 45 percent slopes 501
192C—Cabbart clay loam, 2 to 8 percent slopes 318
195E—Cabbart, very stony-Bronec, stony-Rock outcrop complex, 8 to 35 percent slopes 320
195F—Cabbart, very stony-Rock outcrop-Bronec, very stony, complex, 25 to 60 percent slopes 321
194E—Cabbart-Bronec, stony-Rencot, very stony, complex, 8 to 25 percent slopes 319
193E—Cabbart-Haxby loams, 8 to 45 percent slopes 319
191C—Cabbart-Shoddy-Amesha complex, 2 to 8 percent slopes 316
191D—Cabbart-Shoddy-Amesha complex, 8 to 15 percent slopes 317
191E—Cabbart-Shoddy-Amesha complex, 15 to 45 percent slopes 318
524A—Cardwell loam, 0 to 2 percent slopes 385
47A—Cardwell silty clay loam, 0 to 2 percent slopes 283
471A—Cardwell-Pieriver complex, 0 to 2 percent slopes 378
521A—Cardwell-Riverrun complex, 0 to 2 percent slopes 383
525A—Cardwell-Riverrun complex, 0 to 2 percent slopes, saline 385
523A—Cardwell-Riverrun-Pieriver complex, 0 to 2 percent slopes 384

1842F—Caseypeak, bouldery-Branham, bouldery-Rock outcrop complex, 35 to 60 percent slopes 564
2091E—Caseypeak, bouldery-Franconi, bouldery-Rock outcrop complex, 8 to 35 percent slopes 597
2090F—Caseypeak, very bouldery-Franconi, very bouldery-Rock outcrop complex, 25 to 60 percent slopes 596
2046F—Caseypeak, very bouldery-Rock outcrop-Rubble land association, 15 to 60 percent slopes, cool 592
2045F—Caseypeak, very stony-Rock outcrop-Rubble land association, 15 to 60 percent slopes, dry 592
1842D—Caseypeak-Branham-Rock outcrop complex, 2 to 15 percent slopes 562
1842E—Caseypeak-Branham-Rock outcrop complex, 15 to 35 percent slopes 563
1171F—Castner, bouldery-Rock outcrop complex, 25 to 50 percent slopes 469
1172F—Castner, very bouldery-Rock outcrop complex, 35 to 60 percent slopes 470
1663D—Catgulch, bouldery-Burtoner, bouldery-Rock outcrop complex, 2 to 15 percent slopes 532
1591E—Catgulch, bouldery-Crackerville-Rock outcrop complex, 15 to 45 percent slopes 510
1664E—Catgulch, bouldery-Rock outcrop-Ashbray, bouldery, complex, 4 to 35 percent slopes 533
1667E—Catgulch, extremely bouldery-Baxton, extremely bouldery-Burtoner, bouldery, complex, 15 to 35 percent slopes 534
1665F—Catgulch, very bouldery-Rock outcrop-Connieo, very stony, complex, 35 to 60 percent slopes 534
1662D—Catgulch, very stony-Rock outcrop-Burtoner complex, 4 to 15 percent slopes 532
1661D—Catgulch-Baxton complex, 2 to 15 percent slopes, stony 530
1661E—Catgulch-Baxton complex, 15 to 35 percent slopes, stony 531
2460D—Cedric, bouldery-Jeffcity, bouldery-Rock outcrop complex, 2 to 15 percent slopes 631
2461D—Cedric, bouldery-Rock outcrop-Jeffcity, bouldery, complex, 2 to 15 percent slopes 631
1690F—Cheadle, very stony-Rock outcrop-Tiban, bouldery, complex, 15 to 45 percent slopes 538
791C—Chinook sandy clay loam, 2 to 8 percent slopes, saline 428
79A—Chinook sandy loam, 0 to 2 percent slopes 290
79C—Chinook sandy loam, 2 to 8 percent slopes 291
79D—Chinook sandy loam, 8 to 15 percent slopes 291
79E—Chinook sandy loam, 15 to 25 percent slopes 291
1836E—Clancy, bouldery-Bielenberg, stony-Catgulch, bouldery, complex, 15 to 45 percent slopes 560
1287E—Clancy, very stony-Crampton, bouldery-Bielenberg, very stony, complex, 15 to 45 percent slopes 487
1830E—Clancy-Bielenberg-Breeton complex, 15 to 35 percent slopes 557
1835D—Clancy-Bielenberg-Connieo complex, 4 to 15 percent slopes 559
1837E—Clancy-Bielenberg-Connieo complex, 15 to 35 percent slopes 561
1831D—Clancy-Burtoner, bouldery, complex, 4 to 15 percent slopes 558
1832D—Clancy-Burtoner, bouldery-Rock outcrop complex, 4 to 15 percent slopes 558
1838D—Clancy-Clancy, very stony-Bielenberg complex, 4 to 15 percent slopes 561
1833D—Clancy-Connieo complex, 2 to 15 percent slopes 559

1460C—Clasoil loam, 2 to 8 percent slopes 504
2350D—Clasoil, very stony-Sawicki, bouldery, complex, 4 to 15 percent slopes 622
1861F—Clugulch-Bobowic-Rock outcrop complex, 35 to 70 percent slopes 566
841A—Clunton loam, 0 to 2 percent slopes 431
211A—Clunton silty clay loam, 0 to 2 percent slopes 329
92D—Clunton, Cometcrik, and Perma, stony, soils, 0 to 15 percent slopes 297
84A—Clunton-Faith-Dougcliff complex, 1 to 4 percent slopes 294
232A—Clunton-Wetsand-Bonebasin complex, 0 to 2 percent slopes 331
1628D—Connieo, bouldery-Ashbray, very bouldery-Rock outcrop complex, 2 to 15 percent slopes 520
1626D—Connieo, bouldery-Burtoner, bouldery-Rock outcrop complex, 4 to 15 percent slopes 519
1595E—Connieo, bouldery-Crackerville-Rock outcrop complex, 15 to 45 percent slopes 511
1625F—Connieo, extremely bouldery-Rock outcrop-Burtoner, extremely stony, complex, 35 to 60 percent slopes 518
1622D—Connieo, moist-Rock outcrop complex, 2 to 15 percent slopes 516
1621D—Connieo, stony-Baxton, stony-Rock outcrop complex, 2 to 15 percent slopes 515
1627E—Connieo, very bouldery-Burtoner-Rock outcrop complex, 8 to 35 percent slopes, moist 519
1624F—Connieo, very stony-Baxton, bouldery-Rock outcrop complex, 35 to 60 percent slopes 517
1621E—Connieo, very stony-Baxton, stony-Rock outcrop complex, 15 to 35 percent slopes 515
2691F—Connieo, very stony-Crackerville, stony-Rock outcrop complex, 35 to 60 percent slopes 645
1623E—Connieo-Baxton-Rock outcrop complex, 15 to 35 percent slopes 517
1623D—Connieo-Burtoner complex, 2 to 15 percent slopes 516
1629C—Connieo-Catgulch-Rock outcrop complex, 2 to 8 percent slopes 520
1596C—Connieo-Rock outcrop-Placerton complex, 2 to 8 percent slopes 511
2125F—Cowood, rubbly-Elve, very stony-Rock outcrop complex, 25 to 60 percent slopes 601
971F—Cowood, rubbly-Rock outcrop association, 25 to 60 percent slopes 446
972F—Cowood, very bouldery-Kimpton, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 447
973D—Cowood, very stony-Elve, very stony-Rock outcrop complex, 4 to 25 percent slopes 447
25C—Cozberg sandy loam, 2 to 8 percent slopes 276
251B—Cozberg sandy loam, 1 to 4 percent slopes, stony 334
251D—Cozberg sandy loam, 4 to 15 percent slopes, stony 334
1282D—Crackerville-Bielenberg-Catgulch, bouldery, complex, 8 to 20 percent slopes 485
1283E—Crackerville-Bielenberg-Catgulch, bouldery, complex, 20 to 35 percent slopes 486
1286E—Crackerville-Bielenberg-Catgulch, bouldery, complex, 15 to 35 percent slopes, warm 486
1280D—Crackerville-Catgulch complex, 2 to 15 percent slopes, bouldery 484
1281D—Crackerville-Catgulch, bouldery-Rock outcrop complex, 8 to 25 percent slopes 484
26C—Crago gravelly loam, 2 to 8 percent slopes 276
26D—Crago gravelly loam, 8 to 15 percent slopes 277

26E—Crago gravelly loam, 15 to 25 percent slopes 277
265B—Crago gravelly loam, 1 to 4 percent slopes, stony 339
265D—Crago gravelly loam, 4 to 15 percent slopes, stony 339
265E—Crago very cobbly loam, 15 to 45 percent slopes, very stony 340
266D—Crago, stony-Crago complex, 4 to 15 percent slopes 340
266E—Crago, stony-Crago complex, 15 to 45 percent slopes 341
263F—Crago, stony-Rock outcrop-Pensore, stony, complex, 25 to 60 percent slopes 336
269D—Crago, very stony, and Crago, rubbly, soils, 2 to 15 percent slopes 342
267F—Crago, very stony-Pensore, stony-Rock outcrop complex, 25 to 60 percent slopes 341
268C—Crago-Amesha cobbly loams, 2 to 8 percent slopes 342
264C—Crago-Amesha complex, 2 to 8 percent slopes 337
264D—Crago-Amesha complex, 8 to 15 percent slopes 337
264E—Crago-Amesha complex, 15 to 35 percent slopes 338
264F—Crago-Amesha complex, 35 to 60 percent slopes 338
261D—Crago-Brocko complex, 4 to 15 percent slopes 335
261E—Crago-Brocko complex, 15 to 60 percent slopes 335
3433E—Crago-Musselshell gravelly loams, 4 to 35 percent slopes 653
3141E—Crago-Pensore channery loams, 15 to 45 percent slopes 651
263D—Crago-Rock outcrop-Pensore complex, 4 to 25 percent slopes 336
2701F—Crampton-Catgulch complex, 35 to 60 percent slopes, very stony 647
DAM—Dam 656
151D—Delpoint-Abor complex, 4 to 15 percent slopes 311
1141D—Devilfence very channery loam, 4 to 15 percent slopes 460
1142F—Devilfence-Rock outcrop complex, 35 to 60 percent slopes 461
1142E—Devilfence-Rock outcrop-Wilspring complex, 8 to 35 percent slopes 461
1146E—Deville-Rock outcrop-Wilde complex, 8 to 35 percent slopes 462
1143F—Deville-Wilde-Rock outcrop complex, 25 to 60 percent slopes 462
30A—Dougcliff mucky peat, 0 to 1 percent slopes 279
3—Dumps, mine 268
2031D—Eagleton, stony-Kokoruda-Cometcrik complex, 2 to 25 percent slopes 589
2161E—Ellena, bouldery-Worock, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 602
1933E—Elmark, bouldery-Breeton-Shaboom, bouldery, complex, 15 to 45 percent slopes 573
1947E—Elmark, bouldery-Burtoner-Rock outcrop complex, 8 to 45 percent slopes 576
1946E—Elmark, bouldery-Hoyt-Shaboom, very bouldery, complex, 8 to 35 percent slopes, dry 575
1940E—Elmark, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes 574
1945E—Elmark, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes, dry 574
1910F—Elmark, very bouldery-Rock outcrop-Shaboom, extremely bouldery, complex, 25 to 60 percent slopes 571
1948E—Elmark, very bouldery-Skyview, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 576
1930E—Elmark-Kellygulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes 572
969F—Elve, bouldery-Worock-Rock outcrop complex, 35 to 60 percent slopes 445

2483F—Elve, rubbly-Rock outcrop-Rubble land association, 25 to 60 percent slopes, cool 634
2486F—Elve, rubbly-Rock outcrop-Rubble land complex, 35 to 60 percent slopes 636
968E—Elve, stony-Worock complex, 15 to 35 percent slopes 444
968F—Elve, stony-Worock complex, 35 to 60 percent slopes 445
2471F—Elve, stony-Worock, stony-Rock outcrop complex, 35 to 60 percent slopes 632
965E—Elve, very stony-Cowood, rubbly, complex, 15 to 35 percent slopes 442
967F—Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes 444
964F—Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes, cool 442
965F—Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes, dry 443
964E—Elve, very stony-Elve, rubbly-Cowood, rubbly, complex, 15 to 35 percent slopes 441
2488D—Elve, very stony-Rock outcrop-Rubble land complex, 4 to 35 percent slopes 637
966E—Elve, very stony-Rock outcrop-Rubble land complex, 8 to 35 percent slopes 443
2662E—Elve-Cowood complex, 15 to 45 percent slopes 643
2661F—Elve-Cowood complex, 45 to 70 percent slopes 643
2473E—Elve-Cowood very cobbly loams, 8 to 35 percent slopes, very stony 633
963E—Elve-Warwood complex, 15 to 45 percent slopes, stony 440
2472E—Elvick-Lowder complex, 8 to 25 percent slopes, very bouldery 633
81A—Ethridge clay loam, 0 to 2 percent slopes 292
81C—Ethridge clay loam, 2 to 8 percent slopes 293
811C—Ethridge, saline-Zatony clay loams, 2 to 8 percent slopes 428
324A—Fairway clay loam, 0 to 2 percent slopes 359
322A—Fairway loam, 0 to 2 percent slopes 358
32A—Fairway silt loam, 0 to 2 percent slopes 279
323A—Fairway-Mckenton silt loams, 0 to 2 percent slopes 359
321A—Fairway-Meadowcreek complex, 0 to 2 percent slopes 358
326A—Fairway-Moltoner complex, 0 to 2 percent slopes 360
325A—Fairway-Nestley clay loams, 0 to 2 percent slopes 359
327A—Faith loam, 0 to 2 percent slopes 360
328A—Faith loam, 0 to 2 percent slopes, cool 361
329C—Faith-Slickens complex, 0 to 8 percent slopes, impacted 361
1606D—Farnuf loam, 2 to 15 percent slopes 514
1180E—Farnuf loam, 15 to 35 percent slopes, stony 470
1603C—Farnuf sandy loam, 2 to 8 percent slopes 512
1604D—Farnuf-Farnuf, stony-Burtoner complex, 4 to 15 percent slopes 513
1602C—Farnuf-Placerton sandy clay loams, 2 to 8 percent slopes 512
1605C—Farnuf-Placerton sandy clay loams, 2 to 8 percent slopes, warm 513
1607D—Farnuf-Placerton-Martinsdale complex, 4 to 15 percent slopes 514
1210C—Ferball clay loam, 2 to 8 percent slopes 471
1781E—Firada, stony-Tropal, very stony-Rock outcrop complex, 4 to 25 percent slopes 551
80A—Floweree silt loam, 0 to 2 percent slopes 292
80C—Floweree silt loam, 2 to 8 percent slopes 292
3501B—Fluvaquents-Fluvaquentic Haplustolls complex, 0 to 4 percent slopes 654

2431C—Foolhen, stony-Tibkey, bouldery, complex, 0 to 8 percent slopes 628
1950F—Franconi, very bouldery-Warwood-Caseypeak, very bouldery, complex, 25 to 60 percent slopes 577
451A—Geohrock cobbly clay loam, 1 to 4 percent slopes, stony 377
33E—Geohrock cobbly clay loam, 15 to 35 percent slopes, stony 280
3532B—Geohrock gravelly loam, 2 to 8 percent slopes 655
334D—Geohrock, stony-Bronec, very stony, complex, 4 to 15 percent slopes 363
331C—Geohrock-Bronec gravelly loams, 2 to 8 percent slopes 362
331D—Geohrock-Bronec gravelly loams, 8 to 15 percent slopes 362
3233C—Geohrock-Crago very cobbly loams, 2 to 8 percent slopes 652
332D—Geohrock-Sappington complex, 4 to 15 percent slopes, stony 363
2361F—Gnojek, stony-Rock outcrop-Wickes, stony, complex, 25 to 60 percent slopes 625
2361E—Gnojek, stony-Wickes, stony-Rock outcrop complex, 8 to 35 percent slopes 624
2360F—Gnojek, stony-Wickes, stony-Rock outcrop complex, 35 to 70 percent slopes 624
2360E—Gnojek, stony-Wickes, stony-Shawmut complex, 8 to 35 percent slopes 623
342A—Handke fine sandy loam, 0 to 2 percent slopes 364
1760E—Hanson, stony-Whitore, bouldery, complex, 8 to 35 percent slopes 550
2121F—Hapgood-Hanson-Tiban complex, 25 to 60 percent slopes, very stony 599
2123F—Hapgood-Sebud-Arrowpeak complex, 35 to 60 percent slopes, very stony 600
2122F—Hapgood-Tiban complex, 35 to 70 percent slopes, very stony 600
372A—Havre loam, 0 to 2 percent slopes 367
371A—Havre-Ryell-Handke complex, 0 to 2 percent slopes 366
511C—Haxby-Amesha-Rencot complex, 4 to 15 percent slopes 382
1770E—Helmville, rubbly-Tiban, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 550
1563D—Hilger, rubbly-Hilger complex, 8 to 25 percent slopes 509
1564E—Hilger, very stony-Hilger, rubbly-Rock outcrop complex, 8 to 35 percent slopes 509
1734F—Hiore, stony-Kurrie, stony-Caseypeak, very stony, complex, 35 to 60 percent slopes 543
1871E—Hiore, stony-Rock outcrop complex, 15 to 35 percent slopes 567
1871F—Hiore, stony-Rock outcrop complex, 35 to 70 percent slopes 567
1872E—Hiore-Clugulch-Rock outcrop complex, 15 to 35 percent slopes 568
1872F—Hiore-Clugulch-Rock outcrop complex, 35 to 70 percent slopes 569
2171F—Hiore-Kurrie, stony, complex, 25 to 60 percent slopes 604
3061E—Holter-Castner channery loams, 8 to 45 percent slopes 650
1810F—Hoyt, very stony-Ymark, bouldery-Shaboom, very bouldery, complex, 25 to 60 percent slopes 554
1381D—Jeffcity, stony-Connieo, stony-Rock outcrop complex, 2 to 15 percent slopes 502
2281F—Judco, stony-Torpy, stony-Rock outcrop complex, 35 to 60 percent slopes 616
652C—Judell cobbly loam, 2 to 8 percent slopes 410
662B—Judell gravelly loam, 1 to 4 percent slopes, very stony 411
651C—Judell gravelly loam, 2 to 8 percent slopes 410
655C—Judell gravelly loam, 2 to 8 percent slopes, warm 411
65C—Judell loam, 2 to 8 percent slopes 286
1921D—Judell-Lap, very stony, complex, 4 to 15 percent slopes 571
1921E—Judell-Lap, very stony, complex, 15 to 35 percent slopes 572
2591F—Kadygulch-Roegulch, stony, complex, 35 to 60 percent slopes 642

381C—Kalsted gravelly sandy loam, 2 to 8 percent slopes 367
382D—Kalsted gravelly sandy loam, 4 to 15 percent slopes, stony 367
38C—Kalsted sandy loam, 2 to 8 percent slopes 281
38D—Kalsted sandy loam, 8 to 15 percent slopes 281
1821F—Kellygulch, bouldery-Rock outcrop-Bielenberg complex, 35 to 70 percent slopes 554
1822F—Kellygulch, stony-Shaboom, very bouldery-Rock outcrop association, 45 to 75 percent slopes 555
1823E—Kellygulch, stony-Shaboom, very bouldery-Rock outcrop complex, 15 to 35 percent slopes 556
1823F—Kellygulch, stony-Shaboom, very bouldery-Rock outcrop complex, 35 to 60 percent slopes 556
982F—Kimpton, very bouldery-Rock outcrop-Tiban, very bouldery, complex, 25 to 50 percent slopes 448
87C—Kobarter clay loam, 2 to 8 percent slopes 295
87D—Kobarter clay loam, 8 to 15 percent slopes 295
872E—Kobarter-Abor, stony, complex, 15 to 35 percent slopes 433
2030E—Kokoruda-Elmark, very bouldery-Rock outcrop complex, 8 to 35 percent slopes 588
2451D—Kounter, bouldery-Rock outcrop-Cedric, bouldery, complex, 4 to 25 percent slopes, dry 630
2450E—Kounter, bouldery-Rock outcrop-Cedric, bouldery, complex, 8 to 35 percent slopes 629
2452E—Kounter, very bouldery-Rock outcrop-Jeffcity, bouldery, complex, 15 to 35 percent slopes 630
2161F—Kurrie, very bouldery-Ellena, very bouldery-Rock outcrop complex, 25 to 60 percent slopes 603
88C—Lahood loam, 2 to 8 percent slopes 296
88D—Lahood loam, 8 to 15 percent slopes 296
231A—Ledger-Moltoner-Mckenton complex, 0 to 2 percent slopes 330
233A—Ledger-Wetsand, saline, complex, 0 to 2 percent slopes 331
99D—Libeg gravelly loam, 4 to 15 percent slopes, bouldery 297
991E—Libeg loam, 15 to 35 percent slopes, bouldery 449
99E—Libeg very gravelly loam, 15 to 35 percent slopes, bouldery 298
2711E—Libeg very gravelly loam, 15 to 45 percent slopes 648
997E—Libeg, stony-Monaberg-Adel complex, 15 to 35 percent slopes 451
994E—Libeg, stony-Nieman, bouldery, complex, 15 to 45 percent slopes 450
992E—Libeg, very bouldery-Libeg, bouldery-Nieman, bouldery, complex, 15 to 45 percent slopes 449
999F—Libeg, very stony-Libeg, rubbly, association, 25 to 60 percent slopes 453
999E—Libeg, very stony-Libeg, very bouldery, complex, 4 to 25 percent slopes 453
996D—Libeg-Monaberg gravelly loams, 2 to 15 percent slopes, bouldery 451
2712D—Libeg-Mooseflat loams, 4 to 25 percent slopes 648
998E—Libeg-Nieman, stony, complex, 8 to 25 percent slopes 452
2501D—Lowder-Elvick very cobbly loams, 2 to 15 percent slopes, very bouldery 637
2261D—Lowland loam, 4 to 15 percent slopes, stony 614
2261E—Lowland loam, 15 to 35 percent slopes, stony 615
2261F—Lowland, stony-Rock outcrop-Rubble land complex, 35 to 60 percent slopes 615
2322E—Lowland-Torpy complex, 15 to 35 percent slopes 621
2322F—Lowland-Torpy complex, 35 to 60 percent slopes 621

1960D—Lumpgulch, bouldery-Hoyt-Shaboom, very bouldery, complex, 4 to 15 percent slopes 578
1961E—Lumpgulch, bouldery-Hoyt-Shaboom, very bouldery, complex, 15 to 45 percent slopes 578
1362F—Lumpgulch, bouldery-Rock outcrop complex, 25 to 60 percent slopes 496
1361E—Lumpgulch, bouldery-Rock outcrop-Elmark, bouldery, complex, 8 to 35 percent slopes 496
1965E—Lumpgulch, bouldery-Ymark, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 581
1962E—Lumpgulch, bouldery-Yreka, very bouldery-Shaboom, very bouldery, complex, 15 to 35 percent slopes 579
1963F—Lumpgulch, very bouldery-Rock outcrop-Kellygulch, very bouldery, complex, 25 to 60 percent slopes 580
1964E—Lumpgulch, very bouldery-Shaboom, very bouldery-Rock outcrop complex, 8 to 25 percent slopes 581
2271D—Macabre gravelly loam, 8 to 15 percent slopes 616
2695F—Macabre-Judco-Rock outcrop complex, 35 to 60 percent slopes 646
2695E—Macabre-Nivean complex, 15 to 35 percent slopes 646
2270F—Macabre, very stony-Rock outcrop-Rubble land complex, 35 to 60 percent slopes 615
123E—Maiden, very stony-Rock outcrop-Lap, very stony, complex, 8 to 35 percent slopes 307
123F—Maiden, very stony-Rock outcrop-Lap, very stony, complex, 35 to 60 percent slopes 308
126F—Maiden, very stony-Rock outcrop-Lap, very stony, complex, 35 to 60 percent slopes, warm 310
121E—Maiden-Lap-Rock outcrop complex, 15 to 35 percent slopes 304
121F—Maiden-Lap-Rock outcrop complex, 35 to 60 percent slopes 305
122D—Maiden-Lap-Windham complex, 4 to 15 percent slopes 305
122E—Maiden-Lap-Windham complex, 15 to 35 percent slopes 306
122F—Maiden-Lap-Windham complex, 35 to 60 percent slopes 307
125D—Maiden-Lap-Windham complex, 4 to 15 percent slopes, warm 309
125E—Maiden-Lap-Windham complex, 15 to 35 percent slopes, warm 309
2391C—Marcel, very bouldery-Tibkey, bouldery, complex, 2 to 8 percent slopes 626
73C—Martinsdale loam, 2 to 8 percent slopes 288
1721C—Martinsdale loam, 2 to 8 percent slopes, warm 538
734D—Martinsdale loam, 4 to 15 percent slopes, very stony 416
731C—Martinsdale, stony-Martinsdale-Hilger complex, 2 to 8 percent slopes 414
735C—Martinsdale-Absarook-Whitlash complex, 2 to 8 percent slopes, stony 416
1222C—Martinsdale-Martinsdale, stony-Shawmut complex, 2 to 8 percent slopes 472
1222E—Martinsdale-Martinsdale, stony-Shawmut complex, 15 to 35 percent slopes 472
1722C—Martinsdale-Martinsdale, stony-Shawmut complex, 2 to 8 percent slopes, warm 539
1722E—Martinsdale-Martinsdale, stony-Shawmut complex, 15 to 35 percent slopes, warm 539
1223D—Martinsdale-Shawmut complex, 2 to 15 percent slopes, bouldery 473
1723D—Martinsdale-Shawmut complex, 2 to 15 percent slopes, bouldery, warm 540
732D—Martinsdale-Shawmut, stony-Martinsdale, bouldery, complex, 4 to 25 percent slopes 415
1724D—Martinsdale-Shawmut, stony-Martinsdale, bouldery, complex, 4 to 25 percent slopes, warm 541
736C—Martinsdale-Work complex, 2 to 8 percent slopes 417

23A—Mckenton silt loam, 0 to 2 percent slopes ... 276
21A—Mckenton silty clay loam, 0 to 2 percent slopes ... 275
69A—Meadowcreek silty clay loam, 0 to 2 percent slopes ... 287
691A—Meadowcreek, Clunton, and Cardwell soils, 0 to 2 percent slopes, channeled ... 411
3218A—Meadowcreek-Fairway complex, 0 to 2 percent slopes ... 652
692A—Meadowcreek-Nestley-Riverrun complex, 0 to 2 percent slopes ... 412
M-W—Miscellaneous water ... 657
2301F—Mocmont, bouldery-Roegulch, rubbly-Rock outcrop complex, 25 to 60 percent slopes ... 618
2291F—Mocmont-Kadygulch cobbly loams, 35 to 60 percent slopes, very stony ... 617
40A—Moltoner loam, 0 to 2 percent slopes ... 281
401A—Moltoner silty clay loam, 0 to 2 percent slopes ... 369
2511C—Monaberg loam, 2 to 8 percent slopes, bouldery ... 638
1101E—Monaberg, stony-Libeg, bouldery, complex, 15 to 35 percent slopes ... 455
2331B—Mooseflat loam, 1 to 4 percent slopes ... 622
2332B—Mooseflat-Elvick loams, 1 to 4 percent slopes ... 622
394B—Musselshell-Crago cobbly loams, 1 to 4 percent slopes ... 368
3137B—Musselshell-Crago complex, 2 to 8 percent slopes ... 651
391C—Musselshell-Crago gravelly loams, 2 to 8 percent slopes ... 368
411A—Nestley loam, 0 to 2 percent slopes ... 369
413A—Nestley-Riverrun-Pieriver complex, 0 to 2 percent slopes ... 369
1642F—Nieman, bouldery-Rock outcrop-Libeg, very bouldery, complex, 25 to 60 percent slopes ... 523
1643E—Nieman, stony-Libeg complex, 15 to 35 percent slopes ... 524
1643F—Nieman, stony-Libeg-Rock outcrop complex, 35 to 60 percent slopes ... 524
1641E—Nieman, very stony-Rock outcrop-Libeg, bouldery, complex, 15 to 45 percent slopes ... 522
1640D—Nieman, very stony-Rock outcrop-Libeg, stony, complex, 2 to 15 percent slopes ... 521
1641F—Nieman, very stony-Rock outcrop-Libeg, very stony, complex, 45 to 70 percent slopes ... 522
2252E—Nivean, very stony-Macabre, stony-Rock outcrop complex, 15 to 35 percent slopes ... 614
2251F—Nivean, very stony-Rock outcrop-Rubble land complex, 25 to 60 percent slopes ... 613
2051E—Opitz, bouldery-Branham, very bouldery-Tuggle, very bouldery, complex, 8 to 35 percent slopes ... 593
3486F—Peeler-Rock outcrop complex, 15 to 60 percent slopes ... 653
493D—Pensore-Rock outcrop-Roto complex, 2 to 25 percent slopes ... 382
42D—Perma cobbly loam, 4 to 15 percent slopes, stony ... 282
42E—Perma cobbly loam, 15 to 25 percent slopes, stony ... 283
1351D—Perma stony loam, 2 to 15 percent slopes, very bouldery ... 492
421E—Perma, stony-Whitlash, very stony, complex, 15 to 35 percent slopes ... 370
1357F—Perma, very bouldery-Shaboom, extremely bouldery-Rock outcrop complex, 35 to 60 percent slopes ... 495
429E—Perma, very stony-Perma, rubbly-Rock outcrop complex, 8 to 35 percent slopes ... 376
1353F—Perma, very stony-Whitlash, very stony-Rock outcrop complex, 15 to 45 percent slopes ... 493
422F—Perma, very stony-Whitlash, very stony-Rock outcrop complex, 15 to 45 percent slopes, moist ... 371
427E—Perma-Whitlash complex, 15 to 35 percent slopes, bouldery ... 375

1352E—Perma-Whitlash complex, 15 to 35 percent slopes, bouldery, warm 492
421F—Perma-Whitlash complex, 35 to 60 percent slopes, very stony 371
37A—Pieriver silt loam, 0 to 2 percent slopes 280
341A—Pieriver-Cardwell-Riverrun loams, 0 to 2 percent slopes 364
1272D—Placerton-Connieo-Jeffcity complex, 4 to 15 percent slopes 480
1276D—Placerton-Connieo-Jeffcity complex, 4 to 15 percent slopes, warm 483
1273E—Placerton-Farnuf-Breeton complex, 15 to 35 percent slopes 481
1271D—Placerton-Farnuf-Connieo complex, 8 to 15 percent slopes 479
1275E—Placerton-Farnuf-Connieo complex, 15 to 35 percent slopes 482
1275D—Placerton-Farnuf-Connieo gravelly sandy clay loams, 8 to 15 percent slopes 481
1277C—Placerton-Jeffcity complex, 2 to 8 percent slopes 483
1120E—Quaint channery loam, 8 to 35 percent slopes, very stony 457
1122D—Quaint-Redfist channery loams, 4 to 15 percent slopes 458
1121F—Quaint-Rock outcrop complex, 15 to 45 percent slopes 458
1121E—Quaint-Rock outcrop-Redfist complex, 4 to 25 percent slopes 457
915C—Quincreek channery loam, 2 to 8 percent slopes 434
71C—Raghorn sandy loam, 4 to 8 percent slopes 287
71D—Raghorn sandy loam, 8 to 15 percent slopes 288
713E—Raghorn-Ethridge-Kalsted complex, 15 to 35 percent slopes 413
713F—Raghorn-Ethridge-Kalsted complex, 35 to 70 percent slopes 413
993D—Ratiopeak-Tiban gravelly loams, 4 to 15 percent slopes, bouldery 450
1680D—Raynesford silt loam, 4 to 15 percent slopes 537
952F—Redfern, bouldery-Rock outcrop-Tigeron, very bouldery, complex, 25 to 60 percent slopes 439
953F—Redfern, rubbly-Rock outcrop-Rubble land association, 25 to 60 percent slopes 439
2485F—Redfern, rubbly-Rock outcrop-Tigeron, very bouldery, association, 25 to 70 percent slopes 635
954F—Redfern, rubbly-Rock outcrop-Tigeron, very bouldery, complex, 35 to 70 percent slopes 440
1132D—Redfist, bouldery-Perma, bouldery-Rock outcrop complex, 2 to 35 percent slopes 460
1131C—Redfist-Quaint channery loams, 2 to 8 percent slopes 459
1131D—Redfist-Quaint channery loams, 8 to 15 percent slopes 459
2151E—Releep, very bouldery-Kurrie, very bouldery-Rock outcrop complex, 15 to 35 percent slopes 602
633D—Rencot, very stony-Bronec, very stony-Rock outcrop complex, 4 to 25 percent slopes 404
632E—Rencot, very stony-Lahood, stony-Rock outcrop complex, 25 to 45 percent slopes 403
2043F—Rencot, very stony-Rencot, bouldery-Rock outcrop association, 15 to 60 percent slopes 591
634E—Rencot, very stony-Rock outcrop-Bronec, very stony, complex, 25 to 45 percent slopes 405
631F—Rencot-Bronec-Rock outcrop complex, 35 to 70 percent slopes 401
632C—Rencot-Lahood-Rock outcrop complex, 2 to 8 percent slopes 402
632D—Rencot-Lahood-Rock outcrop complex, 8 to 25 percent slopes 403
631E—Rencot-Rencot, very stony-Rock outcrop complex, 25 to 60 percent slopes 401
631D—Rencot-Rock outcrop-Rencot, stony, complex, 8 to 25 percent slopes 400

2181F—Repkie, very stony-Yreka, stony-Skyview, very bouldery, complex, 25 to 60 percent slopes 605
481A—Riverrun gravelly sandy loam, 0 to 2 percent slopes 378
48A—Riverrun sandy loam, 0 to 2 percent slopes 283
483A—Riverrun, Handke, and Ryell soils, 0 to 2 percent slopes, channeled 379
482A—Riverrun-Cardwell complex, 0 to 2 percent slopes 379
1—Riverwash 268
2041F—Rock outcrop-Catgulch, bouldery, complex, 15 to 70 percent slopes 590
2042F—Rock outcrop-Cheadle, very bouldery-Tiban, very bouldery, complex, 15 to 50 percent slopes 591
777E—Rock outcrop-Clugulch-Bobowic complex, 15 to 35 percent slopes 426
777F—Rock outcrop-Clugulch-Bobowic complex, 35 to 70 percent slopes 426
776D—Rock outcrop-Devilfence association, 2 to 25 percent slopes 425
778E—Rock outcrop-Kounter, very bouldery-Jeffcity, bouldery, complex, 15 to 45 percent slopes 427
775F—Rock outcrop-Lap-Lap, very stony, association, 15 to 70 percent slopes 425
773F—Rock outcrop-Pensore association, 15 to 60 percent slopes 424
77F—Rock outcrop-Pensore, stony-Crago, stony, association, 25 to 60 percent slopes 290
2484F—Rock outcrop-Rubble land-Redfern, rubbly, association, 35 to 70 percent slopes 635
774F—Rock outcrop-Whitlash, bouldery, association, 35 to 70 percent slopes 424
821C—Rothiemay loam, 2 to 8 percent slopes 429
82C—Rothiemay very gravelly loam, 2 to 8 percent slopes 293
492D—Roto-Pensore-Crago complex, 4 to 15 percent slopes 380
492E—Roto-Pensore-Crago complex, 15 to 35 percent slopes 380
492F—Roto-Pensore-Crago complex, 35 to 60 percent slopes, stony 381
2—Rubble land-Rock outcrop association 268
2173F—Rubick gravelly sandy loam, 35 to 60 percent slopes, stony 605
2172F—Rubick, very stony-Rock outcrop complex, 35 to 60 percent slopes 604
52A—Ryell loam, 0 to 2 percent slopes 284
522A—Ryell-Riverrun complex, 0 to 2 percent slopes 384
533A—Sappington clay loam, 0 to 2 percent slopes 386
533C—Sappington clay loam, 2 to 8 percent slopes 387
533D—Sappington clay loam, 8 to 15 percent slopes 387
53C—Sappington gravelly clay loam, 2 to 8 percent slopes 284
538C—Sappington gravelly loam, 2 to 8 percent slopes 390
537B—Sappington loam, 1 to 4 percent slopes, stony 389
537D—Sappington loam, 4 to 15 percent slopes, stony 389
531C—Sappington very cobbly clay loam, 2 to 8 percent slopes 386
536A—Sappington-Amesha complex, 0 to 2 percent slopes 388
532C—Sappington-Amesha complex, 2 to 8 percent slopes 386
539B—Sappington-Amesha complex, 2 to 8 percent slopes, cobbly 390
539C—Sappington-Amesha complex, 2 to 8 percent slopes, stony 391
3033B—Sappington-Amesha loams, 1 to 4 percent slopes 649
3033C—Sappington-Amesha loams, 4 to 8 percent slopes 649
534C—Sappington-Geohrock complex, 2 to 8 percent slopes 387

534D—Sappington-Geohrock complex, 8 to 15 percent slopes 388
1659E—Sawbuck, stony-Sawbuck, bouldery, complex, 15 to 35 percent slopes 530
2682E—Sawbuck, stony-Yreka, stony-Catgulch, very stony, complex, 15 to 45 percent slopes 644
2681E—Sawbuck-Catgulch, stony, complex, 8 to 45 percent slopes 644
1651C—Sawbuck-Sawbuck, very stony-Clasoil complex, 2 to 8 percent slopes 525
1654E—Sawicki, stony-Blaincreek-Tolbert, very stony, complex, 15 to 45 percent slopes ... 526
1658D—Sawicki, stony-Blaincreek, very stony, complex, 4 to 15 percent slopes 529
1657E—Sawicki, very bouldery-Crampton, bouldery-Catgulch, bouldery, complex, 15 to 45 percent slopes 528
1658E—Sawicki, very stony-Blaincreek, very stony-Tolbert, bouldery, complex, 15 to 45 percent slopes 529
1656E—Sawicki-Bielenberg, very stony-Tolbert, very stony, complex, 15 to 45 percent slopes 527
1652E—Sawicki-Clasoil complex, 8 to 35 percent slopes, bouldery 525
1655E—Sawicki-Clasoil complex, 8 to 35 percent slopes, bouldery, warm 527
2110D—Sebud very cobbly loam, 4 to 15 percent slopes, very stony 598
2214E—Sebud, bouldery-Surdal, very bouldery-Arrowpeak, very bouldery, complex, 15 to 35 percent slopes 610
2213E—Sebud, stony-Surdal, stony-Arrowpeak, very stony, complex, 8 to 35 percent slopes 608
2213F—Sebud, stony-Surdal, stony-Arrowpeak, very stony, complex, 35 to 60 percent slopes 609
2211F—Sebud, very stony-Arrowpeak, very stony-Rock outcrop complex, 35 to 60 percent slopes 606
2111E—Sebud, very stony-Hapgood complex, 8 to 45 percent slopes 598
2212E—Sebud, very stony-Libeg, stony-Arrowpeak, stony, complex, 15 to 35 percent slopes 607
2212D—Sebud, very stony-Libeg-Arrowpeak, stony, complex, 4 to 15 percent slopes 607
2211E—Sebud-Arrowpeak, stony, complex, 8 to 45 percent slopes 606
2112D—Sebud-Marcel complex, 4 to 25 percent slopes, bouldery 599
2216D—Sebud-Surdal complex, 4 to 25 percent slopes, stony 611
2215D—Sebud-Tibkey cobbly loams, 2 to 15 percent slopes, bouldery 610
1544E—Shaboom, bouldery-Kellygulch, bouldery-Rock outcrop complex, 8 to 45 percent slopes 508
1541E—Shaboom, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes 505
1543F—Shaboom, extremely bouldery-Kellygulch, extremely bouldery-Rock outcrop complex, 35 to 60 percent slopes 507
1540F—Shaboom, extremely bouldery-Rock outcrop-Elmark, very bouldery, association, 35 to 60 percent slopes 505
2040F—Shaboom, extremely bouldery-Rock outcrop-Rubble land association, 35 to 70 percent slopes 590
1543E—Shaboom, very bouldery-Kellygulch, very bouldery-Rock outcrop complex, 15 to 35 percent slopes 507
1542E—Shaboom, very bouldery-Rock outcrop-Kellygulch, very bouldery, complex, 8 to 35 percent slopes 506
74D—Shawmut gravelly loam, 4 to 15 percent slopes, bouldery 289
2011D—Shawmut gravelly loam, 4 to 15 percent slopes, bouldery, warm 585
744E—Shawmut, bouldery-Shawmut, stony-Tolbert, bouldery, complex, 15 to 35 percent slopes 418
745E—Shawmut, bouldery-Shawmut, very bouldery-Tolbert, bouldery, complex, 15 to 45 percent slopes, dry 419

2013E—Shawmut, bouldery-Wickes, stony-Tolbert, bouldery, complex, 15 to 35 percent slopes 587
2012E—Shawmut, stony-Martinsdale, very stony, complex, 15 to 25 percent slopes, warm 586
2012D—Shawmut, stony-Martinsdale, very stony, complex, 4 to 15 percent slopes, warm 586
742E—Shawmut, stony-Martinsdale, very stony, complex, 4 to 25 percent slopes 417
2020D—Shawmut, stony-Shawmut, bouldery, complex, 4 to 15 percent slopes 588
747E—Shawmut, stony-Tolbert, very stony, complex, 15 to 35 percent slopes 421
748E—Shawmut, stony-Wickes, very stony, complex, 15 to 45 percent slopes 421
746E—Shawmut-Tolbert complex, 8 to 35 percent slopes 420
2014E—Shawmut-Tolbert complex, 8 to 35 percent slopes, warm 587
745D—Shawmut-Wickes-Gnojek complex, 2 to 15 percent slopes, bouldery 419
83C—Shoddy silty clay loam, 2 to 8 percent slopes 293
83D—Shoddy silty clay loam, 8 to 15 percent slopes 294
831E—Shoddy-Cabbart-Kobarter complex, 4 to 25 percent slopes 429
832E—Shoddy-Rock outcrop-Delpoint complex, 2 to 25 percent slopes 430
295D—Sieben cobbly loam, 4 to 15 percent slopes, bouldery 354
293D—Sieben cobbly loam, 4 to 15 percent slopes, stony 353
291C—Sieben complex, 2 to 8 percent slopes 353
297F—Sieben, rubbly-Sieben, very stony, complex, 15 to 60 percent slopes 356
294C—Sieben, stony-Sieberell, very stony, complex, 2 to 15 percent slopes 354
297D—Sieben, very stony-Sieben, rubbly, complex, 2 to 25 percent slopes 355
292C—Sieben-Varney cobbly loams, 2 to 8 percent slopes 353
296D—Sieberell-Sieben-Beaverell complex, 4 to 15 percent slopes, stony 355
1790F—Sigbird, very bouldery-Sigbird, stony-Rock outcrop complex, 25 to 70 percent slopes 551
1191E—Silverchief very cobbly clay loam, 8 to 35 percent slopes, bouldery 471
751C—Sixbeacon gravelly sandy loam, 2 to 8 percent slopes 422
75C—Sixbeacon loam, 2 to 8 percent slopes 289
753C—Sixbeacon-Cozberg complex, 2 to 8 percent slopes 422
754D—Sixbeacon-Cozberg, stony, complex, 4 to 15 percent slopes 423
752B—Sixbeacon-Vendome complex, 1 to 4 percent slopes 422
2001E—Skyview, very bouldery-Elmark, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 585
2000E—Skyview, very bouldery-Rock outcrop-Roegulch, very bouldery, complex, 8 to 35 percent slopes 584
1980F—Stemple cobbly loam, 35 to 60 percent slopes, very stony 582
2421E—Surdal, stony-Arrowpeak, very stony, complex, 4 to 25 percent slopes 627
1731E—Tepecreek, bouldery-Caseypeak, very bouldery-Rock outcrop complex, 8 to 35 percent slopes 541
1735E—Tepecreek, stony-Caseypeak, very bouldery-Rock outcrop complex, 15 to 35 percent slopes 544
1735F—Tepecreek, stony-Caseypeak, very stony-Rock outcrop complex, 35 to 60 percent slopes 545
1731F—Tepecreek, very bouldery-Caseypeak, rubbly-Rock outcrop complex, 35 to 60 percent slopes 542
1732F—Tepecreek, very bouldery-Caseypeak, very bouldery-Rock outcrop complex, 35 to 60 percent slopes 543
1003E—Tiban, bouldery-Cheadle, very bouldery, complex, 15 to 35 percent slopes 454

1004E—Tiban, rubbly-Tiban, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 454
942E—Tigeron extremely gravelly loam, 15 to 35 percent slopes, bouldery 435
941E—Tigeron, bouldery-Tigeron, very bouldery, complex, 15 to 45 percent slopes 435
943F—Tigeron, stony-Tigeron, very stony, complex, 25 to 60 percent slopes 436
945E—Tigeron, very bouldery-Redfern, bouldery-Rock outcrop complex, 15 to 45 percent slopes, dry 437
944E—Tigeron, very bouldery-Redfern, bouldery-Rock outcrop complex, 15 to 45 percent slopes, warm 436
946F—Tigeron, very stony-Redfern, rubbly-Rock outcrop complex, 25 to 60 percent slopes 438
947F—Tigeron, very stony-Redfern, rubbly-Rock outcrop complex, 25 to 60 percent slopes, dry 438
2230B—Tineman cobbly loam, 2 to 8 percent slopes, very stony 613
2441E—Tineman, very stony-Franconi, bouldery-Rock outcrop complex, 4 to 25 percent slopes 628
1675E—Tolbert, very stony-Blaincreek, stony-Rock outcrop complex, 8 to 35 percent slopes 536
245E—Tolbert, very stony-Rock outcrop-Absarook, stony, complex, 8 to 35 percent slopes 333
1675F—Tolbert, very stony-Rock outcrop-Blaincreek, very stony, complex, 35 to 60 percent slopes 537
1672E—Tolbert-Blaincreek complex, 8 to 35 percent slopes 535
1671E—Tolbert-Blaincreek complex, 8 to 35 percent slopes, warm 535
2321E—Torpy gravelly loam, 15 to 35 percent slopes 620
2321F—Torpy gravelly loam, 35 to 60 percent slopes 620
2321D—Torpy loam, 4 to 15 percent slopes 619
2487F—Torpy, rubbly-Rock outcrop-Rubble land complex, 35 to 60 percent slopes 636
1740E—Tropal, bouldery-Hanson, stony-Rock outcrop complex, 8 to 25 percent slopes 545
1741F—Tropal, bouldery-Rock outcrop-Whitore, bouldery, complex, 15 to 45 percent slopes 546
1742F—Tropal, very bouldery-Rock outcrop complex, 25 to 60 percent slopes 547
56A—Trudau loam, 0 to 2 percent slopes 284
56B—Trudau loam, 2 to 8 percent slopes 285
564C—Trudau-Benz clay loams, 2 to 8 percent slopes 395
562C—Trudau-Bronec, saline, complex, 2 to 8 percent slopes 395
1841D—Tuggle-Branham-Rock outcrop complex, 2 to 15 percent slopes 562
362C—Udecide-Varney sandy clay loams, 2 to 8 percent slopes 365
361D—Udecide-Varney-Walbert complex, 4 to 25 percent slopes 365
642C—Varney clay loam, 2 to 8 percent slopes 406
642D—Varney clay loam, 8 to 15 percent slopes 406
643A—Varney cobbly loam, 0 to 2 percent slopes 406
643C—Varney cobbly loam, 2 to 8 percent slopes 407
644C—Varney complex, 2 to 15 percent slopes, gullied 407
641C—Varney gravelly loam, 2 to 8 percent slopes 405
646C—Varney loam, 2 to 8 percent slopes, stony 410
64A—Varney sandy clay loam, 0 to 2 percent slopes 286
64C—Varney sandy clay loam, 2 to 8 percent slopes 286
645D—Varney, stony-Sieben, very stony, complex, 4 to 15 percent slopes 408
645E—Varney, stony-Sieben, very stony, complex, 15 to 35 percent slopes 409

645B—Varney-Sieben complex, 1 to 4 percent slopes, stony 408
781A—Vendome sandy loam, 0 to 8 percent slopes 427
782A—Vendome sandy loam, 0 to 8 percent slopes, stony 428
755A—Vendome very cobbly loam, 0 to 4 percent slopes, very stony 423
2705F—Vitroff-Torpy loams, 35 to 60 percent slopes 647
85D—Walbert coarse sandy loam, 4 to 15 percent slopes 295
852C—Walbert sandy clay loam, 4 to 15 percent slopes 432
851D—Walbert-Shoddy-Cabbart complex, 2 to 15 percent slopes 431
851F—Walbert-Shoddy-Cabbart complex, 15 to 35 percent slopes 432
441F—Warneke-Warneke, very stony-Rock outcrop association, 8 to 60 percent slopes 376
1902D—Warwood, very bouldery-Warwood, very stony-Tigeron, very bouldery, complex, 2 to 15 percent slopes 570
1901F—Warwood-Tigeron, very stony-Cowood, very stony, complex, 25 to 60 percent slopes 569
W—Water 657
60C—Watne loam, 2 to 8 percent slopes 285
6—Wetsand, Cardwell, and Clunton soils, 0 to 2 percent slopes, channeled 270
3685F—Whitecow channery loam, 25 to 60 percent slopes 656
585E—Whitecow, bouldery-Shawmut, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 399
582E—Whitecow, bouldery-Shawmut, very bouldery-Rock outcrop complex, 15 to 45 percent slopes, warm 397
581E—Whitecow, stony-Warneke, very stony-Rock outcrop complex, 8 to 35 percent slopes 396
581F—Whitecow, very stony-Warneke, very stony-Rock outcrop complex, 35 to 70 percent slopes 397
3885F—Whitecow-Warneke channery loams, 15 to 45 percent slopes 656
583E—Whitecow-Warneke complex, 8 to 35 percent slopes 398
584F—Whitecow-Whitecow, stony-Warneke complex, 25 to 60 percent slopes 398
541D—Whitlash, very stony-Brickner, stony-Rock outcrop complex, 4 to 25 percent slopes 391
541E—Whitlash, very stony-Brickner, stony-Rock outcrop complex, 25 to 60 percent slopes 392
241E—Whitlash, very stony-Rock outcrop-Perma, stony, complex, 2 to 25 percent slopes 332
241F—Whitlash, very stony-Rock outcrop-Perma, very stony, complex, 25 to 60 percent slopes 333
1170E—Whitlash-Whitlash, stony-Rock outcrop complex, 15 to 35 percent slopes 469
1750F—Whitore, bouldery-Tropal, very bouldery-Rock outcrop complex, 25 to 45 percent slopes 547
1752E—Whitore, stony-Helmville, bouldery-Firada, very stony, complex, 15 to 45 percent slopes 548
1753E—Whitore, stony-Tropal, very stony-Firada, very stony, complex, 8 to 35 percent slopes 549
1751F—Whitore, very stony-Tropal, very bouldery-Rock outcrop complex, 15 to 45 percent slopes 548
1154F—Wilde, stony-Vigilante-Deville, very stony, complex, 35 to 70 percent slopes 466
1154E—Wilde-Deville-Vigilante complex, 8 to 35 percent slopes 465
1152D—Wilspring-Devilfence complex, 4 to 15 percent slopes 463
1152E—Wilspring-Devilfence-Rock outcrop complex, 15 to 35 percent slopes 464
1153C—Wilspring-Quincreek-Devilfence complex, 2 to 8 percent slopes 464
425E—Wimper gravelly loam, 8 to 35 percent slopes, stony 374

1356E—Wimper gravelly loam, 8 to 35 percent slopes, stony, moist 495
423C—Wimper loam, 2 to 8 percent slopes 372
423D—Wimper loam, 8 to 15 percent slopes 372
423E—Wimper loam, 15 to 35 percent slopes 373
426F—Wimper-Whitlash association, 35 to 60 percent slopes 375
424D—Wimper-Wimper, stony, complex, 4 to 15 percent slopes 373
424E—Wimper-Wimper, stony, complex, 15 to 35 percent slopes 374
1355D—Wimper-Wimper, stony, complex, 4 to 15 percent slopes, warm 493
1355E—Wimper-Wimper, stony, complex, 15 to 35 percent slopes, warm 494
3064D—Windham channery loam, 4 to 15 percent slopes 650
20C—Windham gravelly loam, 2 to 8 percent slopes 274
20D—Windham gravelly loam, 8 to 15 percent slopes 274
203D—Windham gravelly loam, 4 to 15 percent slopes, stony 324
203E—Windham gravelly loam, 15 to 35 percent slopes, stony 324
205E—Windham very cobbly loam, 4 to 35 percent slopes, very stony 326
205F—Windham very cobbly loam, 35 to 60 percent slopes, very stony 327
1341D—Windham very gravelly loam, 2 to 15 percent slopes, very stony 490
20E—Windham very gravelly loam, 15 to 35 percent slopes 275
207E—Windham, stony-Lap, very stony-Rock outcrop complex, 15 to 35 percent slopes 328
207F—Windham, stony-Lap, very stony-Rock outcrop complex, 35 to 70 percent slopes 328
204E—Windham, stony-Maiden, very stony-Lap, very stony, complex, 15 to 35 percent slopes 325
2084E—Windham, stony-Maiden, very stony-Lap, very stony, complex, 15 to 35 percent slopes, warm 595
204F—Windham, very stony-Maiden, very stony-Rock outcrop complex, 25 to 60 percent slopes 326
201F—Windham, very stony-Rock outcrop-Lap, very stony, complex, 35 to 70 percent slopes 322
2081F—Windham, very stony-Rock outcrop-Lap, very stony, complex, 35 to 70 percent slopes, warm 594
202D—Windham-Judell complex, 8 to 15 percent slopes 323
202E—Windham-Judell complex, 15 to 35 percent slopes 323
2082D—Windham-Judell complex, 8 to 15 percent slopes, warm 594
208D—Windham-Judell gravelly loams, 8 to 25 percent slopes, stony 329
2088D—Windham-Judell gravelly loams, 8 to 25 percent slopes, stony, warm 596
1343D—Windham-Judell very cobbly loams, 4 to 15 percent slopes, bouldery 491
1342E—Windham-Lap very cobbly loams, 15 to 45 percent slopes, bouldery 491
204D—Windham-Maiden-Lap complex, 4 to 15 percent slopes 324
201E—Windham-Rock outcrop-Lap, very stony, complex, 8 to 35 percent slopes 322
591F—Windham-Rock outcrop-Warneke complex, 35 to 60 percent slopes 400
3664E—Windham-Whitecow-Lap channery loams, 15 to 45 percent slopes 655
2086E—Windham-Windham, stony, complex, 15 to 35 percent slopes, warm 595
206F—Windham-Windham, stony, complex, 35 to 70 percent slopes 327
1250C—Work cobbly clay loam, 2 to 8 percent slopes, stony 479
1250E—Work very cobbly clay loam, 8 to 25 percent slopes 479
2582F—Worock, rubbly-Rock outcrop-Rubble land complex, 35 to 60 percent slopes 640
2311F—Worock, stony-Cowood, very stony-Rock outcrop complex, 35 to 60 percent slopes 618

2312F—Worock, stony-Elve, stony-Rock outcrop complex, 35 to 60 percent slopes 619
2583D—Worock, stony-Worock, very bouldery, complex, 2 to 15 percent slopes 640
2581E—Worock, very bouldery-Elve, very stony, complex, 15 to 35 percent slopes 638
2582E—Worock, very bouldery-Worock, rubbly, complex, 8 to 35 percent slopes 639
2583F—Worock, very bouldery-Worock, rubbly, complex, 35 to 60 percent slopes 641
2584E—Worock, very bouldery-Worock, rubbly, complex, 15 to 45 percent slopes, dry ... 642
2582D—Worock-Elve very cobbly loams, 2 to 15 percent slopes, very bouldery, cool 639
859C—Yetull loamy fine sand, 2 to 8 percent slopes 433
858E—Yetull-Yetull, stony, complex, 8 to 35 percent slopes 433
1163F—Ymark, very bouldery-Elmark, very bouldery-Rock outcrop complex, 25 to 60 percent slopes 467
1162E—Yreka very cobbly loam, 15 to 35 percent slopes, bouldery 467
1161E—Yreka, bouldery-Hoyt, bouldery-Shaboom, very bouldery, complex, 15 to 45 percent slopes 466
1164F—Yreka-Brickner, stony, complex, 35 to 70 percent slopes 468
221A—Zatony clay loam, 0 to 2 percent slopes, wet 330
22C—Zatony clay loam, 2 to 8 percent slopes 275
721E—Zbart-Bondoe-Brocko complex, 4 to 25 percent slopes 414
72F—Zbart-Rock outcrop association, 25 to 70 percent slopes 288

Foreword

This soil survey contains information that affects land use planning in this survey area. It contains predictions of soil behavior for selected land uses. The survey also highlights certain soil limitations.

This soil survey is designed for many different users. Farmers, ranchers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. The information in this report is intended to identify soil properties that are used in making various land use or land treatment decisions. Statements made in this report are intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

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Soil Survey of
Jefferson County Area and Part of Silver Bow County, Montana

Fieldwork by Edward Brinken, Kenneth Drecksel, Thomas J. Keck, Byron Koepke, Patrick E. McCain, and Donald E. Strom, Natural Resources Conservation Service

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
United States Department of the Interior, Bureau of Land Management, and the Montana Agricultural Experiment Station

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area. The information includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some

of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

The descriptions, names, and delineations of the soils in this survey area may not fully agree with those of the soils in adjacent survey areas. Differences are the result of a better knowledge of soils, modifications in series concepts, or variations in the intensity of mapping or in the extent of the soils in the survey areas.

General Nature of the Survey Area

The survey area is in southwestern Montana (fig. 1). It consists of all land in Jefferson County, except for Federal land within the Deer Lodge and Helena National Forests, and approximately 11,200 acres of Silver Bow County. The survey area makes up 603,500 acres, or about 941 square miles. Whitehall is the county seat of Jefferson County.



Figure 1.—Location of the survey area in Montana.

Physiography, Drainage, and Geology

Jennifer Kouba, student trainee—geologist, Natural Resources Conservation Service, prepared this section.

Physiography

The survey area lies within the Northern Rocky Mountain Province and the Rocky Mountain Fold-Thrust Belt. It includes slightly more than half of Jefferson County and a small portion of southeastern Silver Bow County.

The Continental Divide, which forms much of the western border of Jefferson County, crosses through the Boulder Range. The Boulder Mountains are mainly in areas of national forest and are not included in the survey area. The same is true of the Elkhorn Mountains, which are in northeastern Jefferson County, and most of the smaller Dry Mountain Range in southwestern Jefferson County. The Bull Mountain Range in south-central Jefferson County, Toll Mountain in the southwestern part of the county, and Doherty Mountain in the southeastern
part are included in the survey area.

In general, the mountains of Jefferson County are not very steep or rugged and the intermountain valleys tend to be broad. Relatively narrow canyons are along the upper Boulder River and some minor creeks. The Jefferson River Canyon is also relatively narrow.

Elevation in the survey area ranges from 3,940 feet (1,200 meters) at the point where Prickly Pear Creek leaves Jefferson County to 8,609 feet (2,624 meters) at the peak of Bull Mountain. The highest point in Jefferson County, 9,416 feet (2,870 meters), is Crow Peak in the Elkhorn Mountains.

Drainage

The Jefferson River forms most of the southern border of Jefferson County and provides drainage for most of the county. The main tributary of the Jefferson River in Jefferson County is the Boulder River. This river and its tributaries drain about half of the county. Other tributaries of the Jefferson River include Whitetail and Pipestone Creeks in southwestern Jefferson County and Fish Creek and Lower Cherry Creek in Silver Bow County. A few miles to the east of the survey area, the Jefferson River joins the Madison and Gallatin Rivers to form the Missouri Headwaters at Three Forks.

The northeastern part of the county is drained primarily by Prickly Pear Creek, which flows into the Missouri River several miles north of the Jefferson County border. A few smaller creeks drain the eastern Elkhorn Mountains and flow into the Missouri River east of Jefferson County.

The Continental Divide lies between the Missouri and Snake River systems.

Geologic History

During the early geologic history of the survey area, sedimentary rocks were deposited in marine and brackish water environments. Periods of deposition alternated with periods of erosion as sea levels changed. Shale was deposited in low-energy, deep-water environments; limestone formed in warm, shallow water; and sandstone was deposited in beach and near-shore environments. These sedimentary rocks occur as outcrops in southeastern Jefferson County along the Jefferson River and northeast of Whitehall, south of the Elkhorn Mountains along the eastern border, and near Prickly Pear Creek along the northern border.

The alternating deposition and erosion of sedimentary rocks began approximately 1.5 billion years ago and was the primary geologic event affecting this region until about 90 million years ago, when the ancestral Rocky Mountains began to form. Magmatic intrusion and compressive folding and faulting, initiated by tectonic plate subduction along the west coast, continued until about 70 million years ago.

A long period of erosion followed the formation of the ancestral Rocky Mountains. The second period of tectonism in the Rocky Mountains began approximately 50 million years ago, when the mountains were uplifted by block faulting and volcanic activity resumed. Several rivers, including the Jefferson River, are believed to have flowed south prior to this period of uplift. Uplift of the mountains disrupted the courses of the rivers, causing the formation of closed lake basins in which large amounts of sediment were subsequently deposited. Eventually lake levels rose enough for outlet streams to develop. Jefferson Canyon was probably eroded by the outlet stream of such a lake.

Alpine glaciation further shaped the Elkhorn Mountains, the northern Boulder Mountains, and Bull Mountain. Seismic activity and erosion continue to affect the survey area.

Geologic Units

Surficial geologic units in the survey area range in age from Precambrian to Recent. The most prevalent rock units are the Boulder batholith, the Elkhorn Mountain volcanics, and the Tertiary sediments.

The geologic units are described, from oldest to youngest, in the following paragraphs. Rock units are classified as formations based on lithology and stratigraphic position, which may be subdivided into members or combined in groups or supergroups. Where outcrops are small and formations are difficult to differentiate in the field, rocks are mapped only on the basis of age.

Precambrian Era (4,500 to 570 million years ago).—Formations of the lower Belt supergroup were deposited in a shallow sea that covered much of western Montana.

The pebble, cobble, and boulder conglomerates of the LaHood Formation are the most striking of the Belt outcrops. The depositional environment of this formation is believed to be a submarine fan complex. The boulders of schist, gneiss, and marble were derived from pre-Belt rocks in a highland area. Fine grained marine deposits are also present in the formation. The LaHood type section can be observed in Jefferson Canyon near LaHood Park.

Other Belt formations exposed in the survey area include the Greyson, Spokane, and Empire Formations, which are composed primarily of marine shale.

Paleozoic Era (570 to 240 million years ago).—Sedimentary rocks deposited during the Cambrian (570 to 500 million years ago), Devonian (410 to 360 million years ago), Mississippian (360 to 330 million years ago), Pennsylvanian (330 to 290 million years ago), and Permian (290 to 240 million years ago) Periods outcrop in the survey area but are not differentiated into formations. Rock types within these units include limestone, dolomite, shale, sandstone, quartzite, chert, and rock phosphate. The white cliffs

of Doherty Mountain in southeastern Jefferson County are composed of Cambrian limestone.

The Mississippian rocks, which are primarily limestone, have the largest outcrop area of the Paleozoic units. Limestone is resistant to erosion in dry climates and commonly forms cliffs or steep side slopes. These outcrops are visible east of the Boulder River valley and at Lewis and Clark Caverns State Park.

As seas repeatedly withdrew from and returned to the area, the sediments making up the Paleozoic units were deposited. Western Montana was a land area undergoing erosion during most of the Ordovician and Silurian Periods (500 to 410 million years ago); therefore, there are no geologic units of the Paleozoic age in the survey area.

Mesozoic Era (240 to 66 million years ago).—During the Triassic Period (240 to 205 million years ago), most of Montana was an elevated land surface undergoing erosion. No rocks were deposited in the survey area during this time.

During the Jurassic Period (205 to 138 million years ago), sedimentary rocks were deposited in a sea that covered most of Montana and, later, on the coastal plain that formed as the sea withdrew. These rocks are not differentiated into formations. Rock types include sandstone, shale, and metamorphosed limestone.

The Kootenai Formation, consisting mainly of shale and sandstone, has small outcrops in the southeastern and northern parts of the survey area. The sandstone is a land-laid deposit, and the shale was deposited in a large freshwater lake. The Colorado Group, which is primarily shale deposited in marine areas, outcrops only in the southeastern part of the survey area. These formations were deposited early in the Cretaceous Period (138 to 66 million years ago).

The Elkhorn Mountain volcanics are exposed on Bull Mountain, the hills in southeastern Jefferson County, the Elkhorn Mountains, and the western Boulder Mountains. The rocks are most commonly fine grained, gray to greenish andesites that frequently weather to form talus slopes. The Elkhorn Mountain volcanics have the same chemical composition as the intrusive granitic rocks of the Boulder batholith and are believed to have the same magmatic source (Alt and Hyndman, 1991). The magma that formed the batholith probably contained very little steam, and thus some of it was allowed to rise to the surface while molten. This magma then erupted at the surface to form the extrusive Elkhorn Mountain volcanics that cover the batholith and neighboring sedimentary units.

The Boulder batholith, a large intrusive igneous body, is exposed in most of western and northern Jefferson County and in most of the part of Silver Bow County that is included in the survey area. The rocks of the Boulder batholith are mainly light gray, coarse grained granitic rocks classified as quartz monzonite. These rocks crystallized at relatively shallow depths beneath the Elkhorn Mountain volcanics and were later exposed at the surface when erosion removed the overlying volcanics. The estimated age of the Boulder batholith and Elkhorn Mountain volcanics is between 70 and 80 million years.

Other small igneous rock units of Cretaceous age also occur in the survey area. Diorite sills that intruded into older shale formations are mapped in the foothills south of the Elkhorn Mountains. The Easter Lily and Ringing Rocks granitic stocks outcrop on the south side of Dry Mountain. Both are composed largely of quartz monzonite, but the Ringing Rocks stock also contains mafic monzonite along its southern and western margins. The namesake of the stock is located on the south side, where the mafic monzonite has weathered into a large pile of rust-colored boulders that ring when struck with a hammer.

Cenozoic Era (66 million years ago to present).—Early in the Tertiary Period (66 to 1.5 million years ago), a long period of erosion removed much of the Elkhorn Mountain volcanics. The Lowland Creek volcanics, composed primarily of quartz latite, were erupted during the Oligocene Epoch (38 to 24 million years ago). Rhyolitic volcanics were erupted after the Lowland Creek volcanics. Both units are exposed within the survey area, in north-central Jefferson County. Larger exposures are outside the survey area, in the Boulder Mountains west of the town of Basin.

Tertiary basin-fill sediments, eroded from adjacent mountains, cover a large portion of southern Jefferson County, including most of the Little Whitetail, Boulder, and Jefferson River valleys. The sediments are known as the Bozeman Group and are divided into two formations. The Renova Formation, the lower unit of the Bozeman Group, consists primarily of alternating beds of limestone, mudstone, siltstone, and fine sandstone deposited during the Oligocene Epoch. The formation has a maximum thickness of approximately 3,500 feet (1,070 meters) in the Jefferson River valley.

Deposition of the Renova Formation was followed by a period of erosion, which continued into the Miocene Epoch (24 to 5 million years ago). The climate was dry during the deposition of the Renova Formation but was tropical during the subsequent erosional period. A red paleosol (buried soil) that rests on top of the Renova Formation is evidence of this climatic change.

The climate became arid in the late Miocene and Pliocene (5 to 1.6 million years ago) Epochs, and the Sixmile Creek Formation was deposited. This formation is the upper unit of the Bozeman Group. It consists mainly of medium or coarse grained sand, fine or medium grained sandstone, sandy siltstone, and marl. Deposition of the Sixmile Creek Formation was also followed by a period of erosion. The formation has a maximum thickness of about 2,500 feet (760 meters) in the Jefferson River valley.

Glacial deposits include till and outwash typically composed of coarse boulders derived from intrusive and volcanic rocks. The deposits are associated with episodes of alpine glaciation that occurred in the Elkhorn Mountains, the northern Boulder Mountains, and on Bull Mountain during the Pleistocene Epoch (1.6 to 0.01 million years ago).

Recent deposits (less than 10,000 years old) include travertine, associated with hot springs, and alluvium along Little Whitetail Creek, the Boulder River, and the Jefferson River. The alluvium of the Boulder River is as much as 100 feet (30 meters) in thickness.

Soil Parent Materials

Caves

Carbonate rocks, particularly limestone, are dissolved by ground water to form most caves at or beneath the water table. Speleothems, which include stalactites, stalagmites, flowstone, and globulites (cave popcorn), are formed after the water table has fallen and the cave has become filled with air. As ground water from the unsaturated zone drips, flows, or seeps from cave walls, dissolved minerals (most commonly calcite) precipitate and are deposited to form the speleothems. The growth rate of stalactites has been estimated to be 1 to 4 millimeters per year.

There are six known caves in the survey area (Campbell, 1978). Lewis and Clark Caverns is the most extensive and is the only cave in Montana with regularly scheduled guided tours. The cavern has a total passage length of 4,832 feet (1,473 meters) and contains abundant, well developed speleothems. The other caves range in total passage length from 50 to 370 feet (15 to 113 meters).

Lewis and Clark Caverns formed in the Mission Canyon Formation of the Mississippian-age Madison Group. The steep passages formed along bedding planes that are dipping steeply in this area. The relatively horizontal passages correspond with joint planes that crossed the bedding. Four different cave levels have been recognized, each associated with the declining water table that accompanied the lowering stream level during the downcutting of Jefferson Canyon.

The Madison Group also houses three of the other caves, none of which contains any speleothems. A Recent travertine deposit has a one-room cave that once contained pictographs and other artifacts. The Cambrian-age Meagher Limestone houses one known cave that contains speleothems.

Mineral and Ground-Water Resources

The primary minerals that have been produced in the survey area are gold, silver, copper, lead, and zinc. Several other minerals have been produced in small quantities. Mineralization is most commonly associated with the Boulder batholith and other igneous intrusions.

Numerous placer and lode mines have operated in the survey area since the mid-1800's. As of 1958, the total production had been estimated at $100,000,000 (Roby and others, 1960). Prickly Pear Creek was the most productive placer deposit in the survey area.

Currently, two open pit mines are operating in the survey area. The Golden Sunlight Mine, on the southeast flank of Bull Mountain, produces gold and silver from a Cretaceous breccia pipe. The Montana Tunnels Mine, in the Wickes mining district, produces lead, zinc, gold, and silver from a Tertiary breccia pipe.

Nonmetallic mineral deposits in the survey area include calcite, gypsum, silica, garnet, amethyst, and sapphire. Limestone was quarried for use in smelters at Butte up until 1925. Building stone, including the granite used in the wings of the State Capitol, has been quarried in the survey area. Also, potters in Basin and Cardwell obtain clay from local sources.

The geologic units most commonly used as aquifers in the survey area are Recent alluvium, Tertiary sediments, and fractured zones in the Boulder batholith. As of July 1993, 2,022 water wells in the survey area were registered with the Montana Bureau of Mines and Geology. The majority of these wells yield less than 50 gallons per minute (189 liters per minute). Only 39 of the wells yield more than 50 gallons per minute. Of these, 22 yield more than 500 gallons per minute (1,890 liters per minute) and 8 yield more than 1,000 gallons per minute (3,785 liters per minute). The purpose for which each well was used

(as of July 1993) is tabulated below. Since many of the wells have multiple uses (typically domestic and stockwater uses), the sum of the tabulated uses exceeds the total number of wells.

Total wells	2,115
Domestic	1,564
Stockwater	279
Irrigation	88
Public water supply	50
Monitoring	34
Industrial	31
Unused	21
Commercial	20
Other	10
Recreation	9
Institutional/schools	5
Not reported	4

Geothermal Resources

Known geothermal resources in the survey area include the Boulder, Alhambra, Pipestone, and Renova Hot Springs. Boulder Hot Springs, with an average spring temperature of 76 degrees C and a yield of 1,900 liters per minute, is one of the best geothermal resources in Montana.

Seismicity

The survey area is located within the northern Intermountain Seismic Belt. Shallow earthquakes and earthquake swarms typify this region. Seismic data collected by the Earthquake Studies Office of the Montana Bureau of Mines and Geology lists 836 earthquakes recorded in the survey area between 1982 and 1992; however, only 19 of the earthquakes had a magnitude of more than 2.5 on the Richter scale. Thirteen of these earthquakes were centered in the vicinity of Boulder. The earthquakes of largest magnitude during this period occurred in July and October of 1986 and were 3.5 on the Richter scale. Both earthquakes were centered near Boulder.

Earthquakes with a magnitude of 2.0 or less are known as microearthquakes. They are commonly felt and recorded only on local seismographs. It is unusual for earthquakes with a magnitude of less than 4.5 to cause any significant damage.

Climate

The tables at the end of this section show climate data for the survey area as recorded during various periods at several reporting stations. The tables show data on temperature and precipitation, probable dates of the first freeze in fall and the last freeze in spring, and length of the growing season.

Growing degree days are shown in the temperature and precipitation table. They are equivalent to “heat units.” During the month, growing degree days accumulate by the amount the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

Temperature and Precipitation

(Recorded in the period 1961-1994 at Boulder, 1961-1967 at Whitehall, 1968-1977 at Whitehall Aviation, and 1978-1990 at Cardwell)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
BOULDER:											
January----	33.7	9.3	21.5	55	-29	3	0.55	0.19	0.85	1	8.0
February---	39.3	14.5	26.9	60	-24	8	.33	.11	.51	1	3.3
March------	45.5	19.8	32.6	66	-13	29	.58	.34	.79	2	5.0
April------	55.1	27.1	41.1	78	6	116	.82	.40	1.18	2	4.2
May--------	64.7	35.3	50.0	85	20	315	1.88	1.00	2.66	5	.4
June-------	73.6	42.9	58.2	91	28	545	2.04	1.02	2.93	6	.0
July-------	82.2	47.7	65.0	95	34	771	1.46	.64	2.17	4	.0
August-----	81.8	46.1	63.9	95	30	735	1.33	.54	2.01	3	.0
September--	70.6	36.6	53.6	89	17	414	1.13	.42	1.73	3	.0
October----	59.7	27.9	43.8	80	4	183	.59	.16	.93	1	.3
November---	42.4	18.2	30.3	64	-15	22	.54	.22	.80	1	4.8
December---	34.5	10.7	22.6	55	-28	4	.49	.20	.73	1	6.1
Yearly:											
Average---	56.9	28.0	42.5	---	---	---	---	---	---	---	---
Extreme---	100	-42	---	96	-34	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,144	11.74	9.14	13.79	30	32.2
WHITEHALL:											
January----	36.9	15.3	26.1	55	-21	8	0.29	0.23	0.45	1	3.0
February---	44.2	21.5	32.8	63	-10	28	.21	.06	.33	0	1.6
March------	47.4	20.2	33.8	72	-9	53	.54	.30	.75	1	6.2
April------	57.6	29.2	43.4	80	12	169	.79	.29	1.20	2	4.2
May--------	68.6	37.6	53.1	88	21	410	1.58	1.32	1.84	5	1.1
June-------	75.2	45.1	60.2	92	30	616	2.47	1.34	3.47	8	.0
July-------	85.8	48.4	67.1	96	38	819	.96	.41	1.43	3	.0
August-----	83.6	46.4	65.0	97	33	768	1.07	.24	1.73	2	.0
September--	71.6	39.1	55.4	91	20	439	1.04	.32	1.62	3	.1
October----	64.1	32.4	48.3	82	15	283	.82	.30	1.25	2	.9
November---	47.3	23.4	35.4	68	-1	46	.43	.14	.67	1	2.6
December---	37.7	18.1	27.9	56	-22	11	.27	.13	.39	0	3.9
Yearly:											
Average---	60.0	31.4	45.7	---	---	---	---	---	---	---	---
Extreme---	100	-30	---	98	-27	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,650	10.48	8.82	11.99	28	23.6

See footnote at end of table.

Temperature and Precipitation--Continued

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
WHITEHALL AVIATION:											
January----	34.5	10.9	22.7	58	-35	18	0.44	0.17	0.66	1	6.9
February---	43.0	16.1	29.6	61	-22	14	.17	.06	.28	0	2.5
March------	47.4	20.6	34.0	69	-14	46	.60	.31	.85	2	4.5
April------	57.4	27.3	42.3	79	7	118	.90	.33	1.38	2	2.2
May--------	67.7	35.5	51.6	87	19	363	1.65	1.13	2.12	5	.3
June-------	76.8	43.4	60.1	94	30	591	2.00	.65	3.10	5	.0
July-------	85.5	46.9	66.2	97	33	803	1.17	.46	1.77	3	.0
August-----	83.8	44.6	64.2	97	30	755	1.22	.73	1.65	3	.0
September--	72.0	35.0	53.5	90	20	404	1.45	.71	2.09	4	.4
October----	59.5	27.4	43.5	82	4	160	.90	.44	1.30	3	1.1
November---	45.7	21.1	33.4	65	-12	29	.55	.39	.81	1	1.8
December---	37.4	14.8	26.1	59	-24	12	.28	.18	.43	0	2.6
Yearly:											
Average---	59.2	28.6	43.9	---	---	---	---	---	---	---	---
Extreme---	100	-40	---	98	-36	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,312	11.31	9.44	13.10	29	22.2
CARDWELL:											
January----	37.4	12.5	24.9	59	-26	13	0.43	0.17	0.80	1	3.2
February---	41.9	15.2	28.5	66	-26	23	.42	.20	.69	2	3.3
March------	50.8	23.4	37.1	71	-11	53	1.17	.81	1.50	5	7.9
April------	61.2	29.2	45.2	84	7	195	1.29	.63	1.85	4	1.3
May--------	68.5	37.2	52.9	90	21	400	2.53	1.29	3.61	7	.0
June-------	78.7	43.9	61.3	96	29	637	1.84	1.13	2.47	6	.0
July-------	86.2	48.3	67.3	98	36	843	1.32	.59	1.94	4	.0
August-----	84.6	45.6	65.1	97	33	775	1.22	.52	1.81	3	.0
September--	73.5	37.0	55.3	92	19	451	1.60	.53	2.48	4	.5
October----	63.2	28.7	46.0	82	8	215	.70	.34	1.11	2	.8
November---	45.4	20.4	32.9	69	-14	48	.54	.21	.81	2	4.3
December---	36.3	11.8	24.0	60	-27	14	.41	.15	.63	1	4.1
Yearly:											
Average---	60.6	29.4	45.0	---	---	---	---	---	---	---	---
Extreme---	101	-40	---	100	-34	---	---	---	---	---	---
Total-----	---	---	---	---	---	3,667	13.46	11.27	15.06	41	25.2

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40 degrees F).

Freeze Dates in Spring and Fall

(Recorded in the period 1961-1994 at Boulder and 1968-1977 at Whitehall Aviation)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
BOULDER:			
Last freezing temperature in spring:			
1 year in 10 later than--	May 23	June 11	June 27
2 years in 10 later than--	May 17	June 5	June 21
5 years in 10 later than--	May 5	May 24	June 10
First freezing temperature in fall:			
1 year in 10 earlier than--	Sept. 5	Aug. 31	Aug. 23
2 years in 10 earlier than--	Sept. 11	Sept. 5	Aug. 27
5 years in 10 earlier than--	Sept. 21	Sept. 15	Sept. 5
WHITEHALL AVIATION:			
Last freezing temperature in spring:			
1 year in 10 later than--	May 18	May 30	July 6
2 years in 10 later than--	May 13	May 26	June 29
5 years in 10 later than--	May 3	May 18	June 16
First freezing temperature in fall:			
1 year in 10 earlier than--	Sept. 10	Sept. 4	Aug. 24
2 years in 10 earlier than--	Sept. 14	Sept. 7	Aug. 27
5 years in 10 earlier than--	Sept. 22	Sept. 12	Sept. 1

Growing Season

(Recorded in the period 1961-1994 at Boulder, 1960-1967 at Whitehall, 1968-1977 at Whitehall Aviation, and 1978-1990 at Cardwell)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
BOULDER:			
9 years in 10	115	89	66
8 years in 10	123	98	73
5 years in 10	139	114	87
2 years in 10	155	130	100
1 year in 10	163	138	107
WHITEHALL:			
9 years in 10	123	97	74
8 years in 10	132	108	85
5 years in 10	149	129	106
2 years in 10	166	150	127
1 year in 10	175	161	138
WHITEHALL AVIATION:			
9 years in 10	118	105	53
8 years in 10	126	109	61
5 years in 10	141	116	76
2 years in 10	157	124	92
1 year in 10	165	127	100
CARDWELL:			
9 years in 10	124	101	62
8 years in 10	133	110	73
5 years in 10	151	126	92
2 years in 10	169	142	112
1 year in 10	179	151	123

Formation and Classification of the Soils

This section relates the soils in the survey area to the major factors of soil formation and describes the system of soil classification. The classification and extent of the soils in the survey area are shown in the tables “Classification of the Soils” and “Acreage and Proportionate Extent of the Soils” at the end of this section.

Factors of Soil Formation

Soil is a natural, three-dimensional body on the earth’s surface. Soil has properties that result from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over a period of time.

Although there are many different soils, each soil is the result of the interaction of the same five major factors of soil formation. These factors are the physical and chemical composition of the parent material, the effect of climate on the parent material, the kinds of plants and the organisms living in the soil, the relief of the land, and the length of time that was needed for the soil to form.

Within short distances, the combinations of these factors vary; consequently, the soils that form differ in fertility, productivity, and physical and chemical characteristics. In the following paragraphs, the factors of soil formation are described as they relate to the soils in the survey area.

Climate

Climate, an active force in the formation of soils, is determined mainly by temperature and precipitation. Soils form in rocks that have been broken into suitable materials by erosion and by alternate periods of freezing and thawing. This weathered material is further broken down by chemical reactions, such as solution and hydration.

Precipitation and temperature affect the kind and amount of vegetation that grows on the soil. Vegetation decays and produces organic matter in the soil. Soils that are subject to cool temperatures and high precipitation generally contain more organic matter and have darker colors than soils in areas of warm temperatures and low precipitation.

Living Organisms

Living organisms are active in the formation of soils. Organic matter, which is produced when plants and animals decay, is the main source for the dark surface layer of a soil. Fungi and algae contribute to the decomposition of rock. As rocks decompose, grasses, shrubs, and trees are able to grow and support animal life.

The kinds of plants and animals that occur largely determine the kinds and amounts of organic material added to the soil and how this material is incorporated with the mineral parts of the soil. Roots, rodents, and insects penetrate the soil and influence its structure. Leaves, roots, and whole plants remain on the surface or in the surface layer of the soil, where they are changed to humus by micro-organisms, chemicals in the soil, and insects.

The vegetation in this survey area consists mainly of trees, shrubs, and short and mid grasses. Common rodents are gophers, badgers, and rabbits. Pebbles and stones on the surface of terraces and in many other areas were dug up by burrowing rodents.

Topography

Topography, or relief, is mainly determined by the age of geologic formations and their resistance to erosion by water and wind. In the eroded uplands of the survey area, runoff water has carved deep valleys with many branches into the original bedrock. This rugged relief contrasts sharply with the smooth, low relief of alluvial fans, stream terraces, and the flood plains of river valleys.

In the uplands, the number and distinctness of soil horizons decrease as the slope increases. Steep soils that have a rapid runoff rate have many characteristics similar to those of soils forming in arid climates. Nearly level to moderately sloping soils have the characteristics that are typical for this survey area. Cabbart soils, for example, are mostly moderately

steep or steep. These soils do not have a B horizon. Varney soils, however, which are nearly level to moderately sloping, do have a B horizon.

Parent Material

The soils in this survey area formed in a wide variety of parent materials. Some soils formed in alluvium derived from mixed rock sources. Other soils formed in material weathered from sandstone, shale, limestone, or igneous rocks. Soils that formed in material weathered mainly from sandstone, such as Lahood soils, are sandy because sand is the basic constituent of sandstone. Soils that formed in material weathered from shale, such as Abor soils, are clayey because clay is the basic constituent of shale. Soils that formed in mixed alluvium derived from sandstone and shale, such as Havre soils, are loamy. Soils that formed in material weathered from limestone, such as Windham soils, have a high content of lime. Soils that formed in material weathered from igneous rocks, such as Blaincreek soils, are generally loamy and have a high content of rock fragments.

Time

Change taking place in soils over a long period of time is called soil genesis. The length of time that parent materials have been in place and exposed to climate and living organisms is generally reflected in the degree to which the soil profile has developed. The changes that occur over time give the soil distinct horizons, or layers, by which it can be recognized. The kind and arrangement of these horizons is called soil morphology. Soil morphology is described in terms of color, texture, structure, consistence, thickness, permeability, and chemistry.

Soils are classified as young to mature. The age of a soil is determined from the thickness of the A horizon, the content of organic matter, the content of clay, the depth to which soluble material has been leached, and the form and distribution of calcium carbonate and gypsum in the soil.

Havre loam, 0 to 2 percent slopes, is classified as an Entisol. This soil is a young soil that occurs on flood plains adjacent to streams. It contains little organic matter and has no accumulation of clay. Little translocation of carbonates has occurred to form a Bt or Bk horizon.

Varney soils formed in parent material similar to but much older than that in which the Havre soil formed. Varney soils formed in alluvium and are on alluvial fans and stream terraces. They are mature soils and are classified as Mollisols. They contain enough organic matter to have a moderately dark A horizon. They have a distinct accumulation of clay in the Bt horizon, and nearly all of the carbonates have been leached to a depth below about 12 inches.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1998 and 1999). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. The classification of the soils in the survey area is shown in the table at the end of this section. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Mollisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Ustoll (*Ust*, meaning burnt, plus *oll*, from Mollisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; type of saturation; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Argiustoll (*Argi*, meaning having an argillic horizon, or clay accumulation, plus *ustoll*, the suborder of the Mollisols that have a dry climate).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic subgroup is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other taxonomic class. Each subgroup is identified by one or more adjectives preceding the name of the great group. An example is Calcidic Argiustolls.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect

management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineralogy class, cation-exchange activity class, soil temperature regime, soil depth, and reaction class. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, superactive, frigid Calcidic Argiustolls.

SERIES. The series consists of soils within a family that have horizons similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile.

Soil Series and Their Morphology

In this section, each soil series or family recognized in the survey area is described. The word "family" indicates that the soils were mapped at the family level. For ease of communication, a series name is assigned to each major soil mapped at the family level. Characteristics of the soil and the material in which it formed are identified for each series or family. A pedon, a small three-dimensional area of soil, that is typical of the series or family in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and in "Keys to Soil Taxonomy" (Soil Survey Staff, 1998). Unless otherwise indicated, matrix colors in the descriptions are for dry soil. Following the pedon description is the range of important characteristics of the soils in the series or family.

Abor Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Very slow (less than 0.06 inch per hour)
Landform: Hills, knolls, and ridges
Parent material: Clayey alluvium over residuum derived from semiconsolidated shale interbedded with thin layers of semiconsolidated siltstone
Slope range: 4 to 35 percent
Elevation range: 4,100 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine, smectitic, frigid Leptic Udic Haplusterts

Typical Pedon

Abor clay, in an area of Delpoint-Abor complex, 4 to 15 percent slopes, in rangeland, 1,850 feet south and 200 feet east of the northwest corner of sec. 23, T. 2 N., R. 1 W.

Ap—0 to 6 inches; grayish brown (10YR 5/2) clay, dark grayish brown (10YR 4/2) moist; moderate fine and very fine granular structure; slightly hard, friable, moderately sticky and moderately plastic; moderately alkaline (pH 8.0); abrupt smooth boundary.

Bss1—6 to 14 inches; light brownish gray (10YR 6/2) silty clay, brown (10YR 5/3) moist; strong medium prismatic structure parting to strong medium subangular blocky; hard, firm, very sticky and very plastic; many fine and very fine roots; many fine and very fine tubular pores; common intersecting slickensides; moderately alkaline (pH 8.2); clear wavy boundary.

Bss2—14 to 18 inches; light brownish gray (10YR 6/2) clay, brown (10YR 5/3) moist; moderate medium prismatic structure; hard, firm, very sticky and very plastic; many fine and very fine roots; many fine and very fine tubular pores; common intersecting slickensides; moderately alkaline (pH 8.4); gradual wavy boundary.

Bky—18 to 26 inches; grayish brown (10YR 5/2) shaly silty clay, light olive brown (2.5Y 5/4) moist; moderate medium prismatic structure; slightly hard, friable, moderately sticky and moderately plastic; common very fine roots; 20 percent semiconsolidated shale fragments; disseminated lime, common distinct lime crusts on channers; common seams and masses of gypsum; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Cr—26 to 60 inches; light gray (5Y 7/2), semiconsolidated shale that rubs to clay or silty clay.

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bky horizon: 12 to 20 inches
Depth to Cr horizon: 20 to 40 inches
Percent of surface covered by stones: 0 to 0.1 percent

Ap horizon:
Chroma—2 or 3
Clay content—40 to 50 percent
Calcium carbonate equivalent—0 to 3 percent
Content of rock fragments—0 to 25 percent pebbles

Reaction—pH 7.4 to 8.4

Bss horizon:
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Texture—silty clay or clay
Clay content—40 to 60 percent
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 7.4 to 8.4
Other features—common or many slickensides

Bky horizon:
Hue—2.5Y or 10YR
Value—5 or 6 dry
Chroma—2, 3, or 4
Texture—clay, silty clay, or clay loam
Clay content—40 to 60 percent
Content of rock fragments—5 to 25 percent semiconsolidated shale fragments
Content of gypsum—1 to 5 percent
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.4 to 8.4

Absarook Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Uplands, hills, and ridges
Parent material: Alluvium, colluvium, or residuum derived from hard sandstone or fine grained igneous bedrock
Slope range: 2 to 35 percent
Elevation range: 4,400 to 6,200 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Absarook loam, in an area of Absarook-Beenom complex, 2 to 15 percent slopes, in rangeland, 800 feet south and 2,000 feet west of the northeast corner of sec. 18, T. 1 N., R. 1 W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium and fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots; 5 percent pebbles; slightly acid (pH 6.2); clear wavy boundary.
Bt1—5 to 13 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to strong fine angular blocky; hard, firm, moderately sticky and moderately plastic; many fine and very fine roots; many fine and very fine tubular pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds and gravel surfaces; 5 percent pebbles; slightly acid (pH 6.4); gradual wavy boundary.
Bt2—13 to 25 inches; dark grayish brown (10YR 4/2) clay loam, brown (10YR 4/3) moist; moderate coarse prismatic structure; hard, friable, moderately sticky and moderately plastic; common fine and many very fine roots; common fine and very fine tubular pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds and gravel surfaces; 10 percent pebbles; slightly acid (pH 6.4); gradual wavy boundary.
Bk—25 to 32 inches; light gray (10YR 7/2) clay loam, light brownish gray (10YR 6/2) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine and common very fine roots; common very fine tubular pores; 10 percent pebbles; disseminated lime, few fine masses of lime, many distinct lime casts on pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.
R—32 inches; very dark grayish brown (10YR 3/2), hard, fractured sandstone.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bt horizon: 4 to 9 inches
Depth to Bk horizon: 12 to 25 inches
Depth to bedrock: 20 to 40 inches
Percent of surface covered by stones: 0 to 0.1 percent

A horizon:
Hue—10YR or 2.5Y
Value—3 or 4 dry; 2 or 3 moist
Chroma—2 or 3
Clay content—20 to 27 percent
Content of rock fragments—0 to 30 percent pebbles
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3, 4, or 5 moist
Chroma—2, 3, or 4
Texture—loam, clay loam, or silty clay loam

Clay content—25 to 35 percent
Content of rock fragments—0 to 25 percent pebbles
Reaction—pH 6.1 to 7.8

Bk horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—sandy loam, loam, or clay loam
Clay content—15 to 30 percent
Content of rock fragments—10 to 35 percent (0 to 5 percent cobbles, 10 to 30 percent pebbles)
Calcium carbonate equivalent—15 to 40 percent
Reaction—pH 7.9 to 8.4

Absay Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Very slow (less than 0.06 inch per hour)
Landform: Stream terraces and alluvial fans
Parent material: Saline/sodic alluvium derived from shale or siltstone
Slope range: 0 to 4 percent
Elevation range: 4,000 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine, mixed, superactive, frigid Aridic Leptic Natrustalfs

Typical Pedon

Absay silty clay loam, 0 to 4 percent slopes, in rangeland, 1,000 feet north and 1,875 feet east of the southwest corner of sec. 12, T. 1 N., R. 1 W.

E—0 to 2 inches; light brownish gray (2.5Y 6/2) silty clay loam, dark grayish brown (2.5Y 4/2) moist; strong medium and fine angular blocky structure; hard, very firm, moderately sticky and very plastic; common very fine roots; common very fine pores; strongly effervescent; very strongly alkaline (pH 9.4); abrupt smooth boundary.
Btz—2 to 11 inches; grayish brown (10YR 5/2) silty clay, dark grayish brown (10YR 4/2) moist; strong coarse angular blocky structure; hard, very firm, moderately sticky and very plastic; common very fine roots; common very fine pores; common distinct clay films on faces of peds; common fine threads and masses of salt; strongly effervescent; very strongly alkaline (pH 9.2); gradual irregular boundary.
Btkz—11 to 15 inches; light yellowish brown (2.5Y 6/4) silty clay loam, olive brown (2.5Y 4/4) moist; moderate coarse subangular blocky structure; hard, firm, moderately sticky and very plastic; few very fine roots; common very fine pores; common faint clay films on faces of peds; few fine masses of lime; many fine threads and masses of salts; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.
Bkz—15 to 60 inches; pale brown (10YR 6/3) silty clay, yellowish brown (10YR 5/4) moist; massive; hard, firm, moderately sticky and very plastic; few very fine roots; common very fine pores; disseminated lime, few fine masses of lime; many medium masses and common fine threads of salt; violently effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 2 to 7 inches
Depth to Btkz horizon: 11 to 20 inches

E horizon:
Hue—10YR or 2.5Y
Value—4 or 5 moist
Chroma—2 or 3
Clay content—27 to 35 percent
Content of rock fragments—0 to 15 percent pebbles
Calcium carbonate equivalent—5 to 10 percent
Reaction—pH 7.9 to 9.5

Btz horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Texture—silty clay loam or silty clay
Clay content—35 to 50 percent
Content of rock fragments—0 to 15 percent pebbles
Electrical conductivity—8 to 16 mmhos/cm
Sodium adsorption ratio—13 to 40
Calcium carbonate equivalent—5 to 10 percent
Reaction—pH 8.5 to 9.5

Btkz horizon:
Hue—10YR or 2.5Y
Value—4 or 5 moist
Chroma—3 or 4
Texture—silty clay loam or silty clay
Clay content—30 to 45 percent
Content of rock fragments—0 to 15 percent pebbles
Electrical conductivity—16 to 32 mmhos/cm

Sodium adsorption ratio—13 to 40
Calcium carbonate equivalent—5 to 10 percent
Reaction—pH 7.9 to 9.5

Bkz horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 5 or 6 moist
Chroma—3 or 4
Texture—loam, silt loam, silty clay loam, or silty clay
Clay content—25 to 45 percent
Content of rock fragments—0 to 15 percent pebbles
Electrical conductivity—16 to 32 mmhos/cm
Sodium adsorption ratio—5 to 25
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 9.0

Adel Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans and side slopes of mountains
Parent material: Alluvium derived from fine grained sandstone and igneous rock
Slope range: 1 to 60 percent
Elevation range: 5,500 to 8,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Fine-loamy, mixed, superactive Pachic Haplocryolls

Typical Pedon

Adel loam, in an area of Adel-Libeg complex, 4 to 15 percent slopes, stony, in rangeland, 1,950 feet east and 850 feet south of the northwest corner of sec. 4, T. 5 N., R. 2 W.

A—0 to 9 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; moderate medium and fine granular structure; slightly hard, very friable, slightly sticky and nonplastic; many fine and very fine roots; many very fine pores; 10 percent pebbles; neutral (pH 6.8); clear wavy boundary.
Bw1—9 to 20 inches; dark brown (10YR 3/3) gravelly loam, very dark brown (10YR 2/2) moist; moderate medium and fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots; many very fine and fine pores; 20 percent pebbles; neutral (pH 7.2); gradual wavy boundary.
Bw2—20 to 32 inches; brown (10YR 4/3) gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots; many fine and very fine pores; 25 percent pebbles; neutral (pH 7.2); gradual irregular boundary.
C—32 to 60 inches; brown (10YR 5/3) very gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine pores; 35 percent pebbles; slightly alkaline (pH 7.4).

Range in Characteristics

Soil temperature: 37 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 16 to 40 inches
Percent of surface covered by stones: 0 to 3 percent

A horizon:
Value—2, 3, or 4 dry; 2 or 3 moist
Chroma—1 or 2
Clay content—18 to 27 percent
Content of rock fragments—0 to 15 percent (0 to 5 percent cobbles, 0 to 10 percent pebbles)
Reaction—pH 6.1 to 7.3

Bw horizon:
Value—3, 4, or 5 dry; 2 or 3 moist
Chroma—1, 2, or 3
Clay content—18 to 27 percent
Content of rock fragments—0 to 35 percent (0 to 5 percent cobbles, 0 to 30 percent pebbles)
Reaction—pH 6.1 to 7.8

C horizon:
Hue—2.5Y or 10YR
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Texture—loam or sandy loam
Clay content—10 to 27 percent
Content of rock fragments—15 to 35 percent (0 to 5 percent cobbles, 15 to 35 percent pebbles)
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 6.1 to 7.8

Amesha Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained

Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, hills, and sedimentary plains
Parent material: Alluvium, colluvium, and Tertiary valley fill material
Slope range: 0 to 60 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Coarse-loamy, mixed, superactive, frigid Aridic Calciustepts

Typical Pedon

Amesha loam, 2 to 8 percent slopes, in rangeland, 1,600 feet west and 1,300 feet north of the southeast corner of sec. 34, T. 2 N., R. 4 W.

A—0 to 4 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; moderate fine and medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; 10 percent pebbles; disseminated lime; slightly effervescent; slightly alkaline (pH 7.6); abrupt smooth boundary.

Bk1—4 to 9 inches; brown (10YR 5/3) loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine tubular and interstitial pores; 10 percent pebbles; disseminated lime, common fine threads and masses of lime, common distinct lime coatings on undersides of pebbles; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bk2—9 to 22 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak medium and coarse prismatic structure parting to strong medium and coarse subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; many very fine and fine tubular pores; 10 percent pebbles; disseminated lime, common fine threads and masses of lime, many distinct lime coatings on undersides of fragments; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bk3—22 to 34 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 5/3) moist; weak coarse prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine and fine tubular pores; 15 percent pebbles; disseminated lime, many fine threads and masses of lime, many distinct lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.

BC—34 to 60 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few very fine roots; common very fine tubular pores; 25 percent pebbles; disseminated lime, many fine threads and masses of lime, many distinct lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.2).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Depth to Bk horizon: 4 to 8 inches
Percent of surface covered by stones: 0 to 0.1 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2 or 3
- Texture—loam or silt loam
- Clay content—15 to 25 percent
- Content of rock fragments—0 to 25 percent (0 to 10 percent cobbles, 0 to 15 percent pebbles)
- Calcium carbonate equivalent—5 to 10 percent
- Reaction—pH 7.4 to 8.4

Bk horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, 7, or 8 dry; 4, 5, 6, or 7 moist
- Chroma—2, 3, or 4
- Texture—loam, silt loam, or sandy loam
- Clay content—10 to 18 percent
- Content of rock fragments—5 to 15 percent pebbles
- Calcium carbonate equivalent—15 to 35 percent
- Reaction—pH 7.9 to 8.4

BC horizon:
- Hue—7.5YR, 10YR, or 2.5Y
- Value—6 or 7 dry; 5 or 6 moist
- Chroma—2, 3, or 4
- Texture—sandy loam or loam
- Clay content—10 to 18 percent
- Content of rock fragments—10 to 35 percent pebbles
- Calcium carbonate equivalent—10 to 25 percent
- Reaction—pH 7.9 to 8.4

Anamac Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, stream terraces, and hills
Parent material: Alluvium derived from mixed rock sources
Slope range: 0 to 15 percent
Elevation range: 4,000 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Aridic Haplustolls

Typical Pedon

Anamac loam, 0 to 2 percent slopes, in cropland, 50 feet north and 2,190 feet east of the southwest corner of sec. 34, T. 2 N., R. 4 W.

Ap—0 to 4 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; strong fine and medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; slightly alkaline (pH 7.4); abrupt smooth boundary.

Bw—4 to 12 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to moderate medium and coarse subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine, common fine, and few medium pores; slightly alkaline (pH 7.4); clear smooth boundary.

Bk1—12 to 18 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak medium and coarse prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine, common fine, and few medium tubular pores; 5 percent pebbles; disseminated lime, few fine masses of lime, common distinct lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bk2—18 to 31 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak coarse prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine and common fine pores; 5 percent pebbles; disseminated lime, few fine masses and threads of lime, common distinct lime coatings on undersides of fragments; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.

BC—31 to 60 inches; very pale brown (10YR 7/4) loam, yellowish brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; common very fine and few coarse roots; many very fine pores; 5 percent pebbles; violently effervescent; moderately alkaline (pH 8.2).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bk horizon: 11 to 24 inches

Ap horizon:
- Hue—10YR or 2.5Y
- Chroma—2 or 3
- Texture—loam, silt loam, or clay loam
- Clay content—18 to 30 percent
- Content of rock fragments—0 to 25 percent (0 to 10 percent cobbles, 0 to 15 percent pebbles)
- Calcium carbonate equivalent—0 to 5 percent
- Reaction—pH 7.4 to 8.4; pH 7.4 to 9.0 in the saline phase
- Electrical conductivity—8 to 16 mmhos/cm (saline phase)
- Sodium adsorption ratio—13 to 30 (saline phase)

Bw horizon:
- Hue—10YR or 2.5Y
- Value—4, 5, or 6 dry; 3, 4, or 5 moist
- Chroma—2, 3, or 4
- Texture—loam or clay loam
- Clay content—18 to 35 percent
- Content of rock fragments—0 to 15 percent pebbles
- Calcium carbonate equivalent—0 to 10 percent
- Reaction—pH 7.4 to 8.4; pH 8.5 to 9.6 in the saline phase
- Electrical conductivity—16 to 40 mmhos/cm (saline phase)
- Sodium adsorption ratio—13 to 40 (saline phase)

Bk horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—loam or clay loam
- Clay content—18 to 30 percent
- Content of rock fragments—0 to 15 percent pebbles
- Calcium carbonate equivalent—5 to 15 percent

Reaction—pH 7.9 to 9.0; pH 8.5 to 9.6 in the saline phase
Electrical conductivity—8 to 25 mmhos/cm (saline phase)
Sodium adsorption ratio—13 to 40 (saline phase)

BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—sandy loam, loam, or clay loam
Clay content—10 to 30 percent
Content of rock fragments—5 to 25 percent pebbles
Calcium carbonate equivalent—3 to 10 percent
Reaction—pH 7.9 to 9.0; pH 7.9 to 9.0 in the saline phase
Electrical conductivity—2 to 16 mmhos/cm (saline phase)
Sodium adsorption ratio—4 to 20 (saline phase)

Arrowpeak Family

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Upper side slopes and ridges of mountains
Parent material: Residuum or colluvium derived from fine grained igneous rocks
Slope range: 4 to 60 percent
Elevation range: 5,500 to 8,000 feet
Annual precipitation: 15 to 30 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 30 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Lithic Haplocryolls

Typical Pedon

Arrowpeak very cobbly loam, in an area of Sebud, stony-Surdal, stony-Arrowpeak, very stony, complex, 35 to 60 percent slopes, in rangeland, 850 feet north and 500 feet west of the southeast corner of sec. 13, T. 3 N., R. 4 W.

A—0 to 8 inches; very dark grayish brown (10YR 3/2) very cobbly loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; soft, very friable, slightly sticky and nonplastic; many fine and very fine and few medium roots; 20 percent angular pebbles and 20 percent angular cobbles; neutral (pH 7.0); clear wavy boundary.
Bw—8 to 12 inches; olive brown (2.5Y 4/4) very cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many fine and very fine and few medium roots; many very fine pores; 20 percent angular pebbles and 30 percent angular cobbles; neutral (pH 7.0); clear wavy boundary.
BC—12 to 18 inches; grayish brown (10YR 5/2) very cobbly loam, dark grayish brown (10YR 4/2) moist; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; 20 percent angular pebbles and 40 percent angular cobbles; neutral (pH 7.0); clear wavy boundary.
R—18 inches; hard, fractured fine grained igneous bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 8 and 20 inches
Thickness of the mollic epipedon: 7 to 12 inches
Depth to bedrock: 10 to 20 inches
Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
Value—3 or 4 dry; 2 or 3 moist
Clay content—15 to 27 percent
Content of rock fragments—15 to 60 percent (10 to 25 percent pebbles or channers, 5 to 30 percent cobbles, 0 to 5 percent stones)
Reaction—pH 6.1 to 7.3

Bw horizon:
Value—4 or 5 dry; 3 or 4 moist
Chroma—2, 3, or 4
Clay content—10 to 25 percent
Content of rock fragments—40 to 80 percent (20 to 30 percent pebbles, 20 to 45 percent cobbles, 0 to 5 percent stones)
Reaction—pH 6.1 to 7.3

BC horizon:
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Clay content—10 to 25 percent
Content of rock fragments—40 to 80 percent (20 to 30 percent pebbles, 20 to 45 percent cobbles, 0 to 5 percent stones)
Reaction—pH 6.1 to 7.3

Ashbray Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Somewhat excessively drained

Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Upper side slopes of hills and escarpments
Parent material: Residuum derived from granite
Slope range: 2 to 70 percent
Elevation range: 4,500 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, nonacid, frigid Lithic Ustorthents

Typical Pedon

Ashbray gravelly coarse sandy loam, in an area of Ashbray, rubbly-Rock outcrop-Kellygulch, very stony, complex, 35 to 70 percent slopes; in a forested area, 1,900 feet north and 2,175 feet east of the southwest corner of sec. 17, T. 4 N., R. 3 W.

Oi—1/2 inch to 0; partially decomposed needles, twigs, and leaves.
A—0 to 4 inches; grayish brown (10YR 5/2) gravelly coarse sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine and common fine pores; 30 percent granite pebbles; neutral (pH 6.8); clear smooth boundary.
C—4 to 14 inches; pale brown (10YR 6/3) very gravelly coarse sandy loam, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; common very fine and fine roots; 50 percent granite pebbles; neutral (pH 7.2); clear wavy boundary.
Cr—14 to 17 inches; yellowish brown (10YR 5/4), decomposed granite bedrock (grus) that crushes to very gravelly coarse sand.
R—17 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Cr horizon: 8 to 18 inches
Depth to R layer: 12 to 20 inches
Percent of surface covered by stones/boulders: 0.1 to 30 percent

A horizon:
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Clay content—10 to 20 percent
Content of rock fragments—15 to 35 percent (5 to 20 percent cobbles and stones, 10 to 30 percent pebbles)
Reaction—pH 6.1 to 7.3

C horizon:
Value—6 or 7 dry; 5, 6, or 7 moist
Chroma—2, 3, or 4
Clay content—5 to 18 percent
Content of rock fragments—15 to 60 percent (0 to 10 percent cobbles and stones, 15 to 50 percent pebbles)
Reaction—pH 6.1 to 7.3

Attewan Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour) above the 2C horizon and rapid (6.0 to 20.0 inches per hour) in the 2C horizon
Landform: Stream terraces and plains
Parent material: Alluvium derived from mixed rock sources
Slope range: 0 to 2 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Aridic Argiustolls

Typical Pedon

Attewan cobbly loam, in an area of Attewan-Nippt complex, 0 to 2 percent slopes, in pasture, 1,800 feet south and 1,200 feet east of the northwest corner of sec. 6, T. 9 N., R. 2 W.

A—0 to 2 inches; dark grayish brown (10YR 4/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many fine roots; 10 percent pebbles and 10 percent cobbles; neutral (pH 7.3); clear smooth boundary.
Bt1—2 to 6 inches; grayish brown (2.5Y 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; many fine roots; common fine and very fine pores; common distinct dark grayish brown (10YR 3/2) clay films on faces of peds; 10 percent pebbles; slightly alkaline (pH 7.6); clear smooth boundary.
Bt2—6 to 16 inches; pale brown (10YR 6/3) loam, dark

grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; many very fine roots; common fine and very fine pores; common distinct dark grayish brown (10YR 3/2) clay films on faces of peds; 10 percent pebbles; slightly alkaline (pH 7.4); clear smooth boundary.

Bk—16 to 22 inches; light gray (10YR 7/2) loam, grayish brown (10YR 5/2) moist; weak coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and many very fine roots; many fine and very fine pores; 10 percent pebbles; disseminated lime, common fine masses and threads of lime, common faint lime coatings on undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

2C—22 to 60 inches; light yellowish brown (10YR 6/4) extremely gravelly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; 45 percent pebbles and 20 percent cobbles; disseminated lime, common distinct lime crusts on undersides of rock fragments in the upper part; strongly effervescent; moderately alkaline (pH 8.0).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 9 inches
Depth to Bt horizon: 2 to 8 inches
Depth to Bk horizon: 12 to 18 inches
Depth to 2C horizon: 20 to 40 inches

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 2 or 3 moist
Chroma—2 or 3
Clay content—10 to 20 percent
Content of rock fragments—15 to 35 percent (10 to 20 percent cobbles, 5 to 15 percent pebbles)
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 3 or 4 moist
Chroma—2 or 3
Texture—clay loam or loam
Clay content—20 to 35 percent
Content of rock fragments—0 to 25 percent (0 to 5 percent cobbles, 0 to 20 percent pebbles)
Reaction—pH 6.6 to 7.8

Bk horizon:
Hue—10YR or 2.5Y
Value—7 or 8 dry; 5 or 6 moist
Chroma—2, 3, or 4
Texture—loam, sandy clay loam, or sandy loam
Clay content—15 to 30 percent
Content of rock fragments—0 to 30 percent (0 to 5 percent cobbles, 0 to 25 percent pebbles)
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.4 to 8.4

2C horizon:
Hue—2.5Y or 10YR
Value—5 or 6 dry; 4 or 5 moist
Chroma—3 or 4
Texture—loamy sand, sand, loamy coarse sand, or coarse sand
Clay content—0 to 10 percent
Content of rock fragments—35 to 75 percent (0 to 15 percent stones and cobbles, 35 to 60 percent pebbles)
Calcium carbonate equivalent—1 to 15 percent
Reaction—pH 7.4 to 8.4

Baxton Series

Depth class: Moderately deep (20 to 40 inches) to weathered granite bedrock (grus) and deep (40 to 60 inches) to hard granite bedrock
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Mountains, hills, and ridges
Parent material: Local colluvium, slope alluvium, and residuum derived from granite
Slope range: 2 to 60 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Coarse-loamy, mixed, superactive, frigid Typic Haplustolls

Typical Pedon

Baxton coarse sandy loam, in an area of Baxton, stony-Breeton, bouldery-Catgulch, very stony, complex, 15 to 35 percent slopes, in rangeland, 2,200 feet north and 2,350 feet east of the southwest corner of sec. 26, T. 8 N., R. 4 W.

A—0 to 11 inches; dark grayish brown (10YR 4/2) coarse sandy loam, very dark brown (10YR 2/2) moist; weak fine and very fine granular structure;

soft, very friable, slightly sticky and nonplastic; many very fine and few fine, medium, and coarse roots; many very fine and fine pores; 10 percent granite pebbles; neutral (pH 6.8); clear smooth boundary.

Bw1—11 to 22 inches; yellowish brown (10YR 5/4) gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine and few fine, medium, and coarse roots; common very fine and fine pores; 20 percent granite pebbles; neutral (pH 7.2); clear wavy boundary.

Bw2—22 to 31 inches; light yellowish brown (10YR 6/4) gravelly coarse sandy loam, yellowish brown (10YR 5/4) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and few fine, medium, and coarse roots; common very fine and fine pores; 30 percent granite pebbles; neutral (pH 7.3); clear wavy boundary.

Cr—31 to 57 inches; reddish yellow (7.5YR 6/6), decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand.

R—57 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Thickness of the mollic epipedon: 7 to 14 inches
Depth to Cr horizon: 20 to 40 inches
Depth to R layer: 40 to 60 inches
Percent of surface covered by stones/boulders: 0 to 15 percent

A horizon:
Value—3, 4, or 5 dry; 2 or 3 moist
Chroma—2 or 3
Texture—loam, sandy loam, or coarse sandy loam
Clay content—10 to 20 percent
Content of rock fragments—5 to 15 percent pebbles
Reaction—pH 6.1 to 7.3

Bw1 horizon:
Value—5 or 6 dry; 4 or 5 moist
Chroma—3 or 4
Texture—sandy loam or coarse sandy loam
Clay content—8 to 18 percent
Content of rock fragments—10 to 35 percent pebbles
Reaction—pH 6.1 to 7.3

Bw2 horizon:
Value—6 or 7 dry; 4, 5, or 6 moist
Chroma—3, 4, or 6
Texture—coarse sandy loam or loamy coarse sand
Clay content—5 to 15 percent
Content of rock fragments—15 to 35 percent pebbles
Reaction—pH 6.1 to 7.3

Beanlake Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, outwash fans, and moraines
Parent material: Alpine till or alluvium
Slope range: 4 to 15 percent
Elevation range: 4,400 to 5,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Typic Calciustolls

Typical Pedon

Beanlake stony loam, in an area of Beanlake-Winspect stony loams, 4 to 25 percent slopes, in rangeland, 2,500 feet north and 2,200 feet east of the southwest corner of sec. 19, T. 20 N., R. 7 W., Lewis and Clark County, Montana:

A—0 to 6 inches; dark grayish brown (10YR 4/2) stony loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; 10 percent pebbles and 5 percent stones; slightly alkaline; clear smooth boundary.

Bk—6 to 16 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to weak medium and fine subangular blocky; slightly hard, very friable, sticky and slightly plastic; common very fine roots; many very fine tubular and interstitial pores; 5 percent pebbles and 5 percent cobbles; disseminated lime, continuous faint lime casts on undersides of fragments; violently effervescent; moderately alkaline; gradual smooth boundary.

Bky1—16 to 38 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; weak medium and fine subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common very fine roots; many very fine tubular and interstitial pores; 5 percent cobbles; disseminated lime, continuous faint lime casts on undersides of fragments; common fine seams of gypsum;

violently effervescent; moderately alkaline; gradual smooth boundary.
Bky2—38 to 60 inches; light gray (2.5Y 7/2) cobbly loam, brown (10YR 5/3) moist; weak medium and fine subangular blocky structure; hard, friable, sticky and slightly plastic; few very fine roots; common very fine tubular and interstitial pores; 15 percent pebbles and 20 percent cobbles; disseminated lime, continuous faint lime casts on undersides of fragments; common fine seams and masses of gypsum; violently effervescent; moderately alkaline.

Range in Characteristics

Soil temperature: 42 to 47 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 8 inches

A horizon:
Value—4 or 5 dry; 2 or 3 moist
Chroma—1 or 2
Clay content—15 to 25 percent
Content of rock fragments—15 to 30 percent (5 to 15 percent cobbles and stones, 10 to 15 percent pebbles)
Reaction—pH 7.4 to 8.4

Bk horizon:
Hue—10YR
Value—5, 6, 7, or 8 dry; 3, 4, 5, or 6 moist
Chroma—2 or 3
Clay content—18 to 25 percent
Calcium carbonate equivalent—15 to 25 percent
Content of rock fragments—10 to 35 percent (0 to 20 percent cobbles and stones, 5 to 15 percent pebbles)
Reaction—pH 7.9 to 8.4

Bky1 horizon:
Hue—10YR or 2.5Y
Value—7 or 8 dry; 5 or 6 moist
Chroma—2 or 3
Clay content—18 to 25 percent
Electrical conductivity—0 to 4 mmhos/cm
Calcium carbonate equivalent—15 to 25 percent
Content of gypsum—1 to 3 percent
Content of rock fragments—10 to 35 percent (0 to 20 percent cobbles and stones, 5 to 15 percent pebbles)
Reaction—pH 7.9 to 9.0

Bky2 horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 4 or 5 moist
Chroma—2 or 3
Clay content—18 to 25 percent
Electrical conductivity—0 to 4 mmhos/cm
Content of gypsum—1 to 3 percent
Calcium carbonate equivalent—5 to 15 percent
Content of rock fragments—15 to 40 percent (0 to 5 percent stones, 10 to 20 percent cobbles, 5 to 15 percent pebbles)
Reaction—pH 7.9 to 9.0
Other features—bulk density of more than 1.6 grams per cubic centimeter

Beaverell Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour) above the 2C horizon and rapid (6.0 to 20.0 inches per hour) in the 2C horizon
Landform: Alluvial fans and plains
Parent material: Gravelly and cobbly alluvium derived from mixed rock sources
Slope range: 0 to 15 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Loamy-skeletal over sandy or sandy-skeletal, mixed, superactive, frigid Aridic Argiustolls

Typical Pedon

Beaverell very cobbly sandy clay loam, in an area of Beaverell, very stony-Sieberell, stony, complex, 4 to 15 percent slopes, in rangeland, 700 feet north and 300 feet west of the southeast corner of sec. 10, T. 4 N., R. 3 W.

A—0 to 5 inches; grayish brown (10YR 5/2) very cobbly sandy clay loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; many fine and medium pores; 35 percent rounded cobbles and 15 percent rounded pebbles; slightly alkaline (pH 7.4); clear smooth boundary.
Bt—5 to 12 inches; yellowish brown (10YR 5/4) extremely cobbly sandy clay loam, olive brown (2.5Y 4/4) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many fine and very fine roots; many fine and very fine pores; many faint clay films on faces of peds; 35 percent rounded pebbles and 30 percent rounded cobbles; slightly alkaline (pH 7.4); clear smooth boundary.

Bk—12 to 16 inches; grayish brown (2.5Y 5/2) extremely cobbly sandy loam, olive brown (2.5Y 4/4) moist; weak medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; many fine and very fine roots; many fine and very fine pores; 40 percent cobbles and stones, 35 percent rounded pebbles; disseminated lime, common faint lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 7.9); gradual wavy boundary.

2C—16 to 60 inches; light yellowish brown (2.5Y 6/4) extremely cobbly coarse sand, light olive brown (2.5Y 5/4) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 40 percent cobbles and stones, 35 percent rounded pebbles; common faint lime coatings on undersides of fragments in the upper part; slightly effervescent; slightly alkaline (pH 7.8).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 9 inches
Depth to Bt horizon: 4 to 9 inches
Depth to Bk horizon: 10 to 20 inches
Percent of surface covered by stones/boulders: 0 to 20 percent

A horizon:
- Value—2 or 3 moist
- Chroma—2 or 3
- Texture—loam or sandy clay loam
- Clay content—15 to 30 percent
- Content of rock fragments—25 to 70 percent (15 to 40 percent cobbles and stones, 10 to 30 percent pebbles)
- Reaction—pH 6.6 to 7.8

Bt horizon:
- Hue—10YR or 2.5Y
- Value—3, 4, or 5 dry; 2, 3, or 4 moist
- Chroma—2, 3, or 4
- Texture—clay loam or sandy clay loam
- Clay content—20 to 35 percent
- Content of rock fragments—35 to 70 percent (20 to 35 percent cobbles, 15 to 35 percent pebbles)
- Reaction—pH 6.6 to 7.8

Bk horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—coarse sandy loam or sandy loam
- Clay content—10 to 20 percent
- Content of rock fragments—35 to 75 percent (5 to 40 percent cobbles and stones, 30 to 45 percent pebbles)
- Calcium carbonate equivalent—5 to 10 percent
- Reaction—pH 7.4 to 8.4

2C horizon:
- Hue—10YR or 2.5Y
- Value—4, 5, or 6 (dry or moist)
- Chroma—3, 4, or 6
- Texture—loamy coarse sand or coarse sand
- Clay content—0 to 10 percent
- Content of rock fragments—35 to 80 percent (5 to 40 percent cobbles and stones, 30 to 60 percent pebbles)
- Calcium carbonate equivalent—0 to 5 percent
- Reaction—pH 7.4 to 8.4

Beenom Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Hills, ridges, and escarpments
Parent material: Residuum derived from coarse grained sandstone
Slope range: 2 to 45 percent
Elevation range: 4,200 to 6,000 feet
Annual precipitation: 12 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy, mixed, superactive, frigid Aridic Lithic Argiustolls

Typical Pedon

Beenom loam, in an area of Beenom, stony-Wimper-Whitlash, very stony, complex, 4 to 15 percent slopes, in rangeland, 1,000 feet west and 1,375 feet south of the northeast corner of sec. 18, T. 1 N., R. 1 W.

A—0 to 2 inches; very dark grayish brown (10YR 3/2) loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; 10 percent angular pebbles; neutral (pH 7.2); clear wavy boundary.

Bt1—2 to 8 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; strong medium and coarse subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; many fine and very fine roots; many fine and very fine tubular pores; common faint

brown (10YR 4/3) clay films on faces of peds; 10 percent angular pebbles; slightly alkaline (pH 7.4); clear wavy boundary.
Bt2—8 to 12 inches; brown (10YR 5/3) gravelly clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many very fine and fine pores; many faint brown (10YR 4/3) clay films on faces of peds; 20 percent angular pebbles; slightly alkaline (pH 7.4); clear wavy boundary.
BC—12 to 16 inches; brown (10YR 5/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; 30 percent angular pebbles; neutral (pH 6.6); clear smooth boundary.
R—16 inches; hard, brown (10YR 4/3), coarse grained sandstone.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 11 inches
Depth to Bt horizon: 2 to 9 inches
Depth to bedrock: 10 to 20 inches
Percent of surface covered by stones: 0 to 0.1 percent

A horizon:
Value—3, 4, or 5 dry; 2 or 3 moist
Chroma—2 or 3
Clay content—18 to 27 percent
Content of rock fragments—5 to 25 percent (0 to 5 percent cobbles, 5 to 20 percent pebbles)
Reaction—pH 6.1 to 7.8

Bt horizon:
Value—3, 4, or 5 dry; 2, 3, or 4 moist
Chroma—2 or 3
Texture—clay loam, loam, or sandy clay loam
Clay content—25 to 35 percent
Content of rock fragments—5 to 25 percent (0 to 5 percent cobbles, 5 to 20 percent pebbles)
Reaction—pH 6.6 to 7.8

BC horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Texture—sandy loam or coarse sandy loam
Clay content—10 to 20 percent
Content of rock fragments—15 to 35 percent (0 to 5 percent cobbles, 10 to 30 percent pebbles)
Reaction—pH 6.1 to 7.3

Benz Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Slow (0.06 to 0.2 inch per hour)
Landform: Alluvial fans
Parent material: Saline/sodic alluvium derived mainly from shale
Slope range: 2 to 8 percent
Elevation range: 4,000 to 4,600 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, calcareous, frigid Aridic Ustorthents

Typical Pedon

Benz clay loam, in an area of Trudau-Benz clay loams, 2 to 8 percent slopes, in cropland, 1,100 feet south and 950 feet west of the northeast corner of sec. 2, T. 1 N., R. 3 W.

Ap1—0 to 2 inches; grayish brown (10YR 5/2) clay loam, brown (10YR 4/3) moist; moderate medium platy structure; hard, friable, slightly sticky and slightly plastic; few very fine roots between plates; many vesicular pores; 5 percent shale fragments; disseminated lime; slightly effervescent; strongly alkaline (pH 8.8); clear wavy boundary.
Ap2—2 to 8 inches; grayish brown (10YR 5/2) clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; 5 percent shale fragments; disseminated lime; slightly effervescent; strongly alkaline (pH 8.8); clear wavy boundary.
Ckz1—8 to 31 inches; light brownish gray (2.5Y 6/2) loam, dark grayish brown (2.5Y 4/2) moist; massive; hard, friable, slightly sticky and nonplastic; common very fine roots; common fine and very fine pores; 5 percent shale fragments; disseminated lime, common fine threads and masses of lime; common fine threads and masses of gypsum and salt crystals; violently effervescent; very strongly alkaline (pH 9.4); diffuse wavy boundary.
Ckz2—31 to 44 inches; light brownish gray (2.5Y 6/2) loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; few fine and very fine roots; few fine and very fine pores; 25 percent shale fragments; disseminated lime, common fine and very fine threads and masses of lime; common fine threads and masses of gypsum and salt crystals; strongly

effervescent; very strongly alkaline (pH 9.6); diffuse wavy boundary.
C—44 to 60 inches; light brownish gray (2.5Y 6/2) loam stratified with thin lenses of fine sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots and pores; 50 percent shale fragments; few fine threads of lime; few fine threads of gypsum and salt crystals; slightly effervescent; very strongly alkaline (pH 9.6).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Ckz horizon: 8 to 12 inches

Ap horizon:
Hue—2.5Y or 10YR
Value—5, 6, or 7 dry; 3, 4, or 5 moist
Chroma—2 or 3
Texture—loam or clay loam
Clay content—18 to 35 percent
Electrical conductivity—4 to 8 mmhos/cm
Sodium adsorption ratio—4 to 13
Calcium carbonate equivalent—5 to 10 percent
Reaction—pH 7.4 to 9.0

Ckz1 horizon:
Hue—2.5Y or 10YR
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2 or 3
Texture—loam or clay loam
Clay content—18 to 35 percent
Electrical conductivity—8 to 16 mmhos/cm
Sodium adsorption ratio—13 to 30
Calcium carbonate equivalent—5 to 15 percent
Content of gypsum—2 to 5 percent
Reaction—pH 8.5 to 9.6

Ckz2 and C horizons:
Hue—2.5Y or 10YR
Value—6 or 7 dry; 4, 5, or 6 moist
Chroma—2 or 3
Texture—loam or clay loam with thin strata of fine sandy loam or sandy loam
Clay content—10 to 30 percent
Electrical conductivity—8 to 16 mmhos/cm
Sodium adsorption ratio—13 to 30
Calcium carbonate equivalent—3 to 15 percent
Content of gypsum—2 to 5 percent
Reaction—pH 8.5 to 9.6

Bielenberg Series

Depth class: Deep (40 to 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Ridges and side slopes of hills
Parent material: Alluvium, colluvium, and residuum derived from granite
Slope range: 4 to 70 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Bielenberg sandy clay loam, in an area of Clancy-Bielenberg-Connieo complex, 4 to 15 percent slopes, in rangeland, 1,350 feet south and 150 feet east of the northwest corner of sec. 29, T. 9 N., R. 2 W.

A1—0 to 3 inches; very dark grayish brown (10YR 3/2) sandy clay loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine and common medium roots; many very fine and fine pores; 3 percent pebbles; slightly acid (pH 6.2); clear wavy boundary.
A2—3 to 9 inches; very dark grayish brown (10YR 3/2) coarse sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and common fine pores; 10 percent pebbles; slightly acid (pH 6.2); clear wavy boundary.
BA—9 to 15 inches; brown (10YR 4/3) coarse sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine and few medium roots; many very fine and common fine pores; 10 percent pebbles; slightly acid (pH 6.4); gradual wavy boundary.
Bt—15 to 28 inches; yellowish brown (10YR 5/4) sandy clay loam, brown (10YR 4/3) moist; strong medium prismatic structure; hard, firm, moderately sticky and moderately plastic; few very fine, fine,

and medium roots; common very fine and fine pores; few faint clay films on faces of peds; 10 percent pebbles; neutral (pH 6.6); gradual wavy boundary.

BC—28 to 50 inches; light yellowish brown (10YR 6/4) gravelly coarse sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; few fine and very fine roots; common very fine and few fine pores; 5 percent cobbles, 25 percent pebbles; neutral (pH 6.8); gradual irregular boundary.

Cr—50 to 55 inches; yellowish brown (10YR 5/4), decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand or coarse loamy sand.

R—55 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bt horizon: 7 to 22 inches
Depth to Cr horizon: 40 to 58 inches
Depth to R layer: 43 to 60 inches
Percent of surface covered by stones: 0 to 3 percent

A horizon:
Value—3, 4, or 5 dry; 2 or 3 moist
Chroma—2 or 3
Texture—loam or sandy clay loam
Clay content—18 to 27 percent
Content of rock fragments—0 to 25 percent (0 to 5 percent cobbles, 0 to 20 percent pebbles)
Reaction—pH 6.1 to 7.3

BA horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Texture—sandy clay loam or coarse sandy loam
Clay content—18 to 25 percent
Content of rock fragments—0 to 25 percent (0 to 5 percent cobbles, 0 to 20 percent pebbles)
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—3 or 4
Clay content—18 to 27 percent
Content of rock fragments—5 to 35 percent (0 to 5 percent cobbles, 5 to 30 percent pebbles)
Reaction—pH 6.1 to 7.3

BC horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—3, 4, or 6
Texture—sandy loam or coarse sandy loam
Clay content—10 to 20 percent
Content of rock fragments—15 to 50 percent (0 to 10 percent cobbles, 15 to 40 percent pebbles)
Reaction—pH 6.1 to 7.8

Bignell Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Slow (0.06 to 0.2 inch per hour)
Landform: Alluvial fans and sides of hills
Parent material: Alluvium, colluvium, and alpine till derived from mixed rock sources
Slope range: 15 to 35 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 38 to 42 degrees F
Frost-free period: 90 to 105 days

Taxonomic classification: Clayey-skeletal, mixed, superactive, frigid Typic Haplustalfs

Typical Pedon

Bignell cobbly loam, in an area of Bignell, stony-Yreka, very stony, complex, 15 to 35 percent slopes; in a forested area, 450 feet south and 950 feet west of the northeast corner of sec. 36, T. 9 N., R. 3 W.

Oi—3 inches to 0; undecomposed and slightly decomposed forest litter.

E—0 to 5 inches; grayish brown (10YR 5/2) cobbly loam, dark gray (10YR 4/1) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; common very fine and fine pores; 15 percent cobbles and 15 percent pebbles; moderately acid (5.8 pH); clear smooth boundary.

Bt/E—5 to 12 inches; brown (10YR 5/3) very cobbly loam, grayish brown (10YR 5/2) moist (Bt part, 60 percent); grayish brown (10YR 5/2) very cobbly loam, gray (10YR 5/1) moist (E part, 40 percent); moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; common very fine and fine pores;

common distinct clay films on faces of peds in the Bt part; 30 percent cobbles and 15 percent pebbles; slightly acid (pH 6.5); clear wavy boundary.

Bt1—12 to 25 inches; yellowish brown (10YR 5/4) very cobbly clay, brown (10YR 5/3) moist; strong medium prismatic structure parting to strong fine and medium angular blocky; hard, firm, very sticky and moderately plastic; common very fine and fine roots and few medium and coarse roots; common very fine and fine pores; many distinct clay films on faces of peds, common distinct clay films on rock fragments; 35 percent cobbles and stones and 10 percent pebbles; moderately acid (pH 6.0); clear wavy boundary.

Bt2—25 to 60 inches; yellowish brown (10YR 5/4) very cobbly clay loam, brown (10YR 5/3) moist; strong fine and medium angular blocky structure; hard, firm, moderately sticky and moderately plastic; few very fine, fine, medium, and coarse roots; few very fine and fine pores; many distinct clay films on faces of peds, common distinct clay films on surface of rock fragments; 30 percent cobbles and stones, 20 percent pebbles; moderately acid (pH 5.6).

Range in Characteristics

Soil temperature: 40 to 44 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Percent of surface covered by stones: 0 to 0.1 percent

E horizon:
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—1, 2, or 3
- Clay content—18 to 27 percent
- Content of rock fragments—15 to 35 percent (5 to 20 percent cobbles, 10 to 15 percent pebbles)
- Reaction—pH 5.1 to 7.3

Bt/E horizon:
- Value—5 or 6 dry (Bt part); 5, 6, or 7 dry, 5 or 6 moist (E part)
- Chroma—2, 3, 4, or 6 (Bt part); 1, 2, or 3 (E part)
- Texture—loam or clay loam
- Clay content—18 to 40 percent
- Content of rock fragments—35 to 60 percent (15 to 35 percent cobbles, 15 to 30 percent pebbles)
- Reaction—pH 5.1 to 7.3

Bt horizon:
- Value—5 or 6 dry; 4, 5, or 6 moist
- Chroma—3, 4, or 6
- Texture—clay, sandy clay, or clay loam
- Clay content—35 to 45 percent
- Content of rock fragments—35 to 60 percent (20 to 40 percent cobbles, 15 to 25 percent pebbles)
- Reaction—pH 5.1 to 6.5

Blaincreek Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of hills
Parent material: Local alluvium, colluvium, and residuum derived from fine grained igneous rock
Slope range: 4 to 70 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Blaincreek cobbly loam, in an area of Tolbert, very stony-Rock outcrop-Blaincreek, very stony, complex, 35 to 60 percent slopes, in rangeland, 1,550 feet north and 1,000 feet east of the southwest corner of sec. 18, T. 3 N., R. 4 W.

A—0 to 7 inches; dark grayish brown (10YR 4/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; 15 percent cobbles and 15 percent angular pebbles; neutral (pH 6.6); clear wavy boundary.

Bt1—7 to 13 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine tubular pores; common distinct clay films on faces of peds and on surfaces of rock fragments; 10 percent cobbles and 30 percent angular pebbles; neutral (pH 6.8); gradual wavy boundary.

Bt2—13 to 17 inches; brown (10YR 5/3) very cobbly loam, dark brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine

tubular and interstitial pores; common faint clay films on faces of peds and on surfaces of rock fragments; 25 percent cobbles and 20 percent angular pebbles; neutral (pH 7.2); gradual wavy boundary.

BC—17 to 25 inches; grayish brown (10YR 5/2) very cobbly loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; common very fine roots; common very fine and fine pores; 25 percent cobbles and 25 percent angular pebbles; slightly alkaline (pH 7.4); clear smooth boundary.

R—25 inches; hard, brown (10YR 4/3), fractured fine grained igneous bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bt horizon: 6 to 12 inches
Depth to bedrock: 20 to 40 inches
Percent of surface covered by stones: 0 to 3 percent

A horizon:
- Value—4 or 5 dry; 2 or 3 moist
- Chroma—2 or 3
- Clay content—15 to 27 percent
- Content of rock fragments—15 to 40 percent (0 to 15 percent cobbles, 15 to 25 percent angular pebbles)
- Reaction—pH 6.1 to 7.3

Bt horizon:
- Hue—10YR or 2.5Y
- Value—4, 5, or 6 dry; 2, 3, or 4 moist
- Chroma—2, 3, or 4
- Texture—loam or clay loam
- Clay content—25 to 35 percent
- Content of rock fragments—30 to 60 percent (5 to 30 percent angular cobbles, 20 to 40 percent angular pebbles)
- Reaction—pH 6.1 to 7.8

BC horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 2, 3, or 4 moist
- Chroma—2, 3, or 4
- Texture—loam or clay loam
- Clay content—20 to 35 percent
- Content of rock fragments—35 to 70 percent (15 to 40 percent angular cobbles, 20 to 40 percent angular pebbles)
- Reaction—pH 6.1 to 7.8

Bobowic Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Ridges and side slopes of mountains
Parent material: Local colluvium, slope alluvium, and residuum derived from granite
Slope range: 4 to 70 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 40 to 70 days

Taxonomic classification: Coarse-loamy, mixed, superactive Ustic Eutrocryepts

Typical Pedon

Bobowic gravelly coarse sandy loam, in an area of Bobowic, very bouldery-Rock outcrop-Tepecreek, very bouldery, complex, 25 to 60 percent slopes; in a forested area, 2,500 feet north and 300 feet west of the southeast corner of sec. 4, T. 1 N., R. 6 W.

Oi—1 inch to 0; forest litter of partially decomposed needles, twigs, and leaves.

A—0 to 3 inches; dark grayish brown (10YR 4/2) gravelly coarse sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; 20 percent pebbles; neutral (pH 7.0); clear smooth boundary.

E—3 to 11 inches; light brownish gray (10YR 6/2) gravelly coarse sandy loam, dark grayish brown (10YR 4/2) moist; moderate thick platy structure parting to weak fine angular blocky; soft, very friable, slightly sticky and nonplastic; many very fine roots and few fine and medium roots; many very fine and few fine pores; 25 percent pebbles; neutral (pH 7.0); clear wavy boundary.

Bw—11 to 21 inches; brown (10YR 5/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; many very fine roots and few fine and medium roots; many very fine and few fine pores; 25 percent pebbles; neutral (pH 7.0); clear wavy boundary.

Cr—21 to 34 inches; light brownish gray (10YR 6/2), decomposed granite bedrock (grus) that crushes to gravelly loamy coarse sand.

R—34 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 8 and 24 inches or between a depth of 8 inches and bedrock (if it occurs at a depth of less than 24 inches)
Depth to Cr horizon: 20 to 38 inches
Depth to R layer: 23 to 40 inches
Percent of surface covered by stones/boulders: 0.1 to 3.0 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—4 or 5 dry; 2, 3, or 4 moist
- Chroma—1, 2, or 3
- Texture—coarse sandy loam or sandy loam
- Clay content—10 to 20 percent
- Content of rock fragments—10 to 35 percent (0 to 5 percent cobbles, 10 to 30 percent pebbles)
- Reaction—pH 6.1 to 7.3

E horizon:
- Hue—10YR or 2.5Y
- Value—6 or 7 dry; 4 or 5 moist
- Chroma—2 or 3
- Texture—coarse sandy loam or sandy loam
- Clay content—10 to 18 percent
- Content of rock fragments—5 to 35 percent (0 to 15 percent cobbles, 15 to 35 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bw horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2, 3, or 4
- Texture—coarse sandy loam or sandy loam
- Clay content—10 to 18 percent
- Content of rock fragments—10 to 35 percent pebbles
- Reaction—pH 6.1 to 7.3

Bondoe Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Alluvial fans
Parent material: Alluvium and colluvium derived mainly from hard shale
Slope range: 4 to 15 percent
Elevation range: 4,000 to 4,800 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Aridic Haplustalfs

Typical Pedon

Bondoe channery loam, 4 to 15 percent slopes, in rangeland, 1,600 feet south and 1,750 feet east of the northwest corner of sec. 36, T. 2 N., R. 3 W.

A—0 to 4 inches; light brownish gray (2.5Y 6/2) channery loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; 20 percent channers; neutral (pH 7.2); clear wavy boundary.

Bt—4 to 11 inches; grayish brown (2.5Y 5/2) channery clay loam, dark grayish brown (2.5Y 4/2) moist; strong medium prismatic structure; hard, friable, moderately sticky and slightly plastic; many very fine and few fine roots; many very fine pores; common faint clay films on faces of peds; 20 percent channers; neutral (pH 7.2); clear wavy boundary.

Bk—11 to 23 inches; grayish brown (2.5Y 5/2) very channery loam, dark grayish brown (2.5Y 4/2) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine pores; 40 percent channers; disseminated lime, continuous distinct lime coatings on coarse fragments; strongly effervescent; slightly alkaline (pH 7.4); gradual irregular boundary.

C—23 to 60 inches; gray (10YR 5/1) very channery loam, dark grayish brown (2.5Y 4/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine pores; 55 percent channers; slightly effervescent; slightly alkaline (pH 7.6).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 3 to 7 inches
Depth to Bk horizon: 10 to 18 inches

A horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry
- Chroma—2 or 3
- Clay content—18 to 25 percent
- Content of rock fragments—15 to 30 percent shale channers
- Reaction—pH 6.6 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 or 3
Texture—loam or clay loam
Clay content—25 to 35 percent
Content of rock fragments—15 to 35 percent shale channers
Reaction—pH 6.6 to 7.8

Bk horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—loam or silt loam
Clay content—18 to 27 percent
Content of rock fragments—35 to 60 percent shale channers
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.4 to 8.4

C horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—1, 2, or 3
Texture—loam or silt loam
Clay content—18 to 27 percent
Content of rock fragments—35 to 60 percent shale channers
Calcium carbonate equivalent—3 to 10 percent
Reaction—pH 7.4 to 8.4

Bonebasin Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Very poorly drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour) above the 2C horizon and rapid (6.0 to 20.0 inches per hour) in the 2C horizon
Landform: Flood plains and drainageways
Parent material: Recent alluvium derived from mixed rock sources
Slope range: 0 to 2 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Fluvaquentic Endoaquolls

Typical Pedon

Bonebasin loam, in an area of Clunton-Wetsand-Bonebasin complex, 0 to 2 percent slopes, in pasture, 1,200 feet south and 1,500 feet west of the northeast corner of sec. 4, T. 5 N., R. 4 W.

Oe—2 inches to 0; very dark grayish brown (10YR 3/2) mucky peat, black (10YR 2/1) moist; neutral (pH 6.8); clear smooth boundary.
A—0 to 6 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; many faint yellowish red (5YR 5/6) redox concentrations; moderate medium subangular blocky structure; slightly hard, firm, moderately sticky and slightly plastic; many very fine and fine roots; common very fine and fine pores; neutral (pH 6.8); clear smooth boundary.
Ag—6 to 13 inches; grayish brown (2.5Y 5/2) loam, very dark grayish brown (2.5Y 3/2) moist; many distinct yellowish red (5YR 5/6) redox concentrations; common faint very dark gray (5Y 3/1) redox depletions; moderate medium subangular blocky structure; slightly hard, very friable, moderately sticky and slightly plastic; many very fine roots; many very fine and fine pores; neutral (pH 6.7); clear smooth boundary.
Cg1—13 to 19 inches; brown (7.5YR 5/2) gravelly sandy loam, dark brown (7.5YR 4/2) moist; common distinct strong brown (7.5YR 5/6) redox concentrations; common faint very dark gray (5Y 3/1) redox depletions; massive; slightly hard, very friable, slightly sticky and nonplastic; many very fine roots; common very fine and fine pores; 25 percent pebbles; neutral (pH 6.6); clear smooth boundary.
Cg2—19 to 23 inches; grayish brown (10YR 5/2) loam, dark brown (10YR 3/3) moist; many distinct very dark gray (5Y 3/1) redox depletions; few faint yellowish red (5YR 5/6) redox concentrations; massive; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine and fine pores; 5 percent pebbles; neutral (pH 6.7); clear smooth boundary.
2C—23 to 60 inches; brown (7.5YR 5/2) extremely gravelly loamy sand and sand, dark brown (7.5YR 4/2) moist; common distinct yellowish red (5YR 5/6) redox concentrations; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; 15 percent cobbles and 50 percent pebbles; neutral (pH 6.8).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches

Thickness of the mollic epipedon: 10 to 15 inches
Water table: At the surface to 12 inches below the surface for extended periods during spring and summer
Depth to 2C horizon: 20 to 40 inches

A horizons:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 2 or 3 moist
Chroma—1 or 2
Clay content—18 to 27 percent
Content of rock fragments—0 to 5 percent pebbles
Reaction—pH 6.6 to 7.3

Cg horizon:
Hue—10YR, 7.5YR, 2.5Y, or 5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—1, 2, or 3
Texture—loam or silt loam or strata of sandy loam, clay loam, or sand and gravel
Clay content—18 to 27 percent
Content of rock fragments—5 to 25 percent pebbles
Reaction—pH 6.6 to 7.8

2C horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—1 or 2
Texture—loamy sand, loamy coarse sand, or sand
Clay content—0 to 10 percent
Content of rock fragments—35 to 70 percent (10 to 20 percent cobbles, 25 to 50 percent pebbles)
Reaction—pH 6.1 to 7.3

Branham Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Ridges and side slopes of mountains
Parent material: Local colluvium, slope alluvium, and residuum derived from granite
Slope range: 0 to 70 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Coarse-loamy, mixed, superactive Ustic Haplocryolls

Typical Pedon

Branham sandy loam, in an area of Branham-Opitz-Tuggle complex, 2 to 15 percent slopes, in rangeland, 1,300 feet west and 50 feet south of the northeast corner of sec. 17, T. 1 S., R. 6 W.

A—0 to 8 inches; very dark gray (10YR 3/1) sandy loam, black (10YR 2/1) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine roots; 10 percent granite pebbles; slightly acid (pH 6.2); clear wavy boundary.
Bw1—8 to 12 inches; brown (10YR 4/3) coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many very fine pores; 10 percent granite pebbles; neutral (pH 6.6); clear wavy boundary.
Bw2—12 to 16 inches; brown (10YR 5/3) gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; many fine and very fine pores; 25 percent granite pebbles; neutral (pH 6.8); gradual smooth boundary.
BC—16 to 30 inches; yellowish brown (10YR 5/6) gravelly loamy coarse sand; single grain; loose, nonsticky and nonplastic; few very fine roots; 30 percent granite pebbles; neutral (pH 6.8); gradual wavy boundary.
Cr—30 to 36 inches; yellowish brown (10YR 5/6), decomposing granite bedrock (grus) that textures to very gravelly loamy coarse sand.
R—36 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Thickness of the mollic epipedon: 7 to 12 inches
Depth to Cr horizon: 20 to 38 inches
Depth to R layer: 23 to 40 inches
Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
Value—3 or 4 dry; 2 or 3 moist
Chroma—1 or 2
Texture—coarse sandy loam, sandy loam, or loam
Clay content—8 to 27 percent
Content of rock fragments—5 to 35 percent (0 to 15 percent cobbles, 5 to 20 percent pebbles)
Reaction—pH 5.6 to 7.3

Bw horizon:
Value—4 or 5 dry; 3 or 4 moist
Chroma—2, 3, or 4

Texture—coarse sandy loam or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—10 to 35 percent (0 to 10 percent cobbles, 10 to 25 percent pebbles)
Reaction—pH 6.1 to 7.8

BC horizon:
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, 4, or 6
Texture—coarse sand or loamy coarse sand
Clay content—4 to 10 percent
Content of rock fragments—15 to 35 percent (0 to 5 percent cobbles, 15 to 30 percent pebbles)
Reaction—pH 6.1 to 7.8

Breeton Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Alluvial fans, stream terraces, and side slopes of hills
Parent material: Alluvium or colluvium derived from granite
Slope range: 1 to 45 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Coarse-loamy, mixed, superactive, frigid Pachic Haplustolls

Typical Pedon

Breeton gravelly loam, 2 to 8 percent slopes, in rangeland, 1,900 feet north and 2,500 feet east of the southwest corner of sec. 28, T. 8 N., R. 4 W.

A1—0 to 4 inches; very dark grayish brown (10YR 3/2) gravelly loam, black (10YR 2/1) moist; moderate medium granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; 15 percent granite pebbles; neutral (pH 6.6); clear wavy boundary.
A2—4 to 12 inches; very dark gray (10YR 3/1) gravelly loam, black (10YR 2/1) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine pores; 15 percent granite pebbles; neutral (pH 7.0); gradual wavy boundary.
Bw—12 to 26 inches; dark grayish brown (10YR 4/2) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; moderate coarse prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine pores; 20 percent granite pebbles; slightly alkaline (pH 7.4); gradual irregular boundary.
BC—26 to 60 inches; brown (10YR 5/3) gravelly coarse sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; 25 percent granite pebbles; slightly alkaline (pH 7.6).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Thickness of the mollic epipedon: 16 to 28 inches
Percent of surface covered by boulders: 0 to 0.1 percent

A horizon:
Hue—10YR or 2.5Y
Value—3 or 4 dry; 2 or 3 moist
Chroma—1 or 2
Texture—loam, coarse sandy loam, or sandy loam
Clay content—8 to 25 percent
Content of rock fragments—0 to 15 percent pebbles
Reaction—pH 6.1 to 7.3

Bw horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2 or 3
Texture—sandy loam, coarse sandy loam, or loam
Clay content—8 to 18 percent
Content of rock fragments—5 to 30 percent pebbles
Reaction—pH 6.1 to 7.8

BC horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Texture—coarse sandy loam, loamy coarse sand, or sandy loam
Clay content—5 to 15 percent
Content of rock fragments—10 to 30 percent pebbles
Reaction—pH 6.1 to 7.8

Brickner Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained

Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of hills
Parent material: Residuum derived from hard, fine grained sandstone or igneous rock
Slope range: 4 to 70 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Lithic Haplustalfs

Typical Pedon

Brickner gravelly sandy clay loam, stony, in an area of Brickner, stony-Whitlash, very stony-Rock outcrop complex, 35 to 60 percent slopes; in a forested area, 2,550 feet north and 875 feet east of the southwest corner of sec. 13, T. 1 N., R. 2 W.

Oi—1/2 inch to 0; forest litter of partially decomposed needles, twigs, and leaves.
A—0 to 3 inches; brown (10YR 4/3) gravelly sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; 25 percent angular pebbles; neutral (pH 6.6); clear wavy boundary.
Bt—3 to 8 inches; dark yellowish brown (10YR 4/4) very gravelly sandy clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine and few medium roots; common very fine and fine pores; common faint brown (10YR 4/3) clay films on faces of peds and bridging sand grains; 5 percent angular cobbles and 35 percent angular pebbles; moderately acid (pH 6.0); clear wavy boundary.
BC—8 to 12 inches; yellowish brown (10YR 5/4) extremely gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common very fine and fine roots and few medium roots; 15 percent angular cobbles and 55 percent angular pebbles; moderately acid (pH 6.0); clear smooth boundary.
R—12 inches; hard, fractured fine grained sandstone.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)
Depth to Bt horizon: 3 to 5 inches
Depth to bedrock: 10 to 20 inches
Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Texture—loamy coarse sand, loam, or sandy clay loam
Clay content—10 to 25 percent
Content of rock fragments—15 to 50 percent (0 to 15 percent cobbles, 15 to 30 percent pebbles)
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2, 3, or 4
Clay content—20 to 30 percent
Content of rock fragments—35 to 60 percent (0 to 10 percent cobbles, 35 to 50 percent pebbles)
Reaction—pH 5.6 to 7.3

BC horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—sandy loam, coarse sandy loam, or sandy clay loam
Clay content—12 to 25 percent
Content of rock fragments—45 to 70 percent (0 to 5 percent stones, 0 to 15 percent cobbles, and 45 to 60 percent pebbles)
Reaction—pH 5.6 to 7.3

Brocko Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, ridges, and side slopes of hills
Parent material: Alluvium and eolian material
Slope range: 0 to 35 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Coarse-silty, mixed, superactive, frigid Aridic Calciustepts

Typical Pedon

Brocko silt loam, 2 to 8 percent slopes, in cropland, 300 feet west and 2,640 feet north of the southeast corner of sec. 36, T. 3 N., R. 1 W.

Ap—0 to 5 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; common very fine roots; disseminated lime; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.

Bk1—5 to 12 inches; light gray (10YR 7/2) silt loam, brown (10YR 5/3) moist; weak medium prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots; many fine and very fine pores; disseminated lime, common fine seams and masses of lime; violently effervescent; moderately alkaline (pH 8.4); gradual smooth boundary.

Bk2—12 to 24 inches; light gray (10YR 7/2) silt loam, brown (10YR 5/3) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots; many fine and very fine pores; disseminated lime, common fine seams and masses of lime; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

Bk3—24 to 60 inches; white (10YR 8/2) silt loam, light brownish gray (10YR 6/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; disseminated lime, few fine threads and masses of lime; strongly effervescent; strongly alkaline (pH 8.6).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to calcic horizon: 5 to 8 inches

Ap horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2 or 3
Clay content—10 to 18 percent
Calcium carbonate equivalent—5 to 10 percent
Reaction—pH 7.4 to 8.4

Bk horizon:
Hue—10YR or 2.5Y
Value—6, 7, or 8 dry; 4, 5, or 6 moist
Chroma—2 or 3
Texture—silt loam or very fine sandy loam
Clay content—10 to 18 percent
Electrical conductivity—2 to 8 mmhos/cm
Sodium adsorption ratio—0 to 13
Calcium carbonate equivalent—15 to 35 percent
Reaction—pH 7.9 to 9.0

Bronec Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, sides of hills, escarpments, and valley floors
Parent material: Alluvium, colluvium, and Tertiary valley fill material
Slope range: 0 to 70 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Aridic Calciustepts

Typical Pedon

Bronec gravelly loam, in an area of Bronec-Amesha complex, 2 to 8 percent slopes, in rangeland, 2,390 feet east and 2,160 feet north of the southwest corner of sec. 4, T. 2 N., R. 4 W.

A—0 to 2 inches; grayish brown (10YR 5/2) gravelly loam, dark brown (10YR 3/3) moist; weak medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; 15 percent pebbles; disseminated lime; slightly effervescent; slightly alkaline (pH 7.6); clear wavy boundary.

Bk1—2 to 9 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; many fine and very fine pores; 25 percent pebbles; disseminated lime, few fine masses and threads of lime, common faint lime coatings on undersides of pebbles; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

Bk2—9 to 21 inches; very pale brown (10YR 7/3) gravelly loam, pale brown (10YR 6/3) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; hard, friable, moderately sticky and slightly plastic; few fine and very fine roots; common fine and very fine pores; 30 percent pebbles; disseminated lime, common fine masses and threads of lime, common distinct

lime coatings on pebbles; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
Bk3—21 to 35 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 5/3) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine roots; common very fine pores; 45 percent pebbles; disseminated lime, common fine masses and threads of lime, common distinct lime coatings on undersides of pebbles; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
Bk4—35 to 48 inches; pale brown (10YR 6/3) very gravelly sandy loam, yellowish brown (10YR 5/4) moist; weak coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; 45 percent pebbles; disseminated lime, few faint lime coatings on undersides of pebbles; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.
BC—48 to 60 inches; brown (10YR 5/3) very gravelly loamy sand, dark brown (10YR 3/3) moist; single grain; loose, nonsticky and nonplastic; 40 percent pebbles; few faint lime coatings on undersides of pebbles; strongly effervescent; moderately alkaline (pH 8.0).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bk horizon: 2 to 6 inches
Percent of surface covered by stones: 0 to 3 percent

A horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 3 or 4 moist
Chroma—2, 3, or 4
Texture—loam or fine sandy loam
Clay content—5 to 25 percent
Content of rock fragments—10 to 60 percent (0 to 20 percent cobbles and stones, 10 to 40 percent pebbles)
Reaction—pH 6.6 to 8.4; pH 8.5 to 9.6 in the saline phase
Electrical conductivity—8 to 16 mmhos/cm (saline phase)
Sodium adsorption ratio—13 to 30 (saline phase)

Bk1 horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Clay content—15 to 27 percent
Content of rock fragments—15 to 60 percent (0 to 10 percent cobbles and stones, 15 to 50 percent pebbles)
Calcium carbonate equivalent—3 to 15 percent
Electrical conductivity—0 to 4 mmhos/cm; 16 to 30 mmhos/cm in the saline phase
Sodium adsorption ratio—13 to 30 (saline phase)
Reaction—pH 7.4 to 8.4; pH 8.5 to 9.6 in the saline phase

Bk2 horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—loam or sandy loam
Clay content—15 to 27 percent
Content of rock fragments—20 to 60 percent (0 to 20 percent cobbles and stones, 20 to 50 percent pebbles)
Calcium carbonate equivalent—15 to 40 percent
Electrical conductivity—0 to 4 mmhos/cm; 4 to 25 mmhos/cm in the saline phase
Reaction—pH 7.9 to 9.0; pH 8.5 to 9.6 in the saline phase

Bk3 and Bk4 horizons:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—loam or sandy loam
Clay content—15 to 25 percent
Content of rock fragments—35 to 60 percent (0 to 25 percent cobbles and stones, 25 to 50 percent pebbles)
Calcium carbonate equivalent—5 to 25 percent
Electrical conductivity—0 to 4 mmhos/cm; 4 to 25 mmhos/cm in the saline phase
Sodium adsorption ratio—4 to 20 (saline phase)
Reaction—pH 7.4 to 8.4; pH 8.4 to 9.6 in the saline phase

BC horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 3, 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—sandy loam, coarse sandy loam, or loamy sand
Clay content—10 to 20 percent
Content of rock fragments—35 to 70 percent (0 to 25 percent cobbles and stones, 25 to 60 percent pebbles)
Calcium carbonate equivalent—3 to 25 percent
Reaction—pH 7.4 to 8.4; pH 8.5 to 9.6 in the saline phase
Electrical conductivity—4 to 25 mmhos/cm (saline phase)

Sodium adsorption ratio—4 to 20 (saline phase)

Burtoner Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Ridges, escarpments, and side slopes of hills
Parent material: Local colluvium, alluvium, and residuum derived from granite
Slope range: 2 to 60 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Burtoner sandy clay loam, in an area of Burtoner-Connieo, bouldery-Rock outcrop complex, 4 to 15 percent slopes, in rangeland, 2,400 feet north and 100 feet west of the southeast corner of sec. 11, T. 5 N., R. 4 W.

A—0 to 8 inches; grayish brown (10YR 5/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine and fine and few medium pores; 10 percent granite pebbles; neutral (pH 7.2); clear smooth boundary.

Bt1—8 to 14 inches; yellowish brown (10YR 5/4) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; many very fine and few fine roots; many very fine and few fine pores; many faint clay films bridging sand grains and common faint clay films on faces of peds; 10 percent granite pebbles; slightly alkaline (pH 7.5); clear wavy boundary.

Bt2—14 to 23 inches; yellowish brown (10YR 5/4) sandy clay loam, brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine and few fine pores; many faint clay films bridging sand grains and common faint clay films on faces of peds; 10 percent granite pebbles; neutral (pH 7.3); clear wavy boundary.

Cr—23 to 28 inches; light brownish gray (2.5Y 6/2), decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand.

R—28 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 7 to 15 inches
Depth to Cr horizon: 20 to 38 inches
Depth to R layer: 23 to 40 inches
Percent of surface covered by stones/boulders: 0 to 15 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—3, 4, or 5 dry; 2 or 3 moist
- Chroma—1, 2, or 3
- Texture—loam, coarse sandy loam, sandy loam, or sandy clay loam
- Clay content—10 to 25 percent
- Content of rock fragments—0 to 60 percent (0 to 20 percent cobbles and stones, 0 to 40 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bt horizon:
- Hue—10YR or 2.5Y
- Value—4, 5, or 6 dry; 3 or 4 moist
- Chroma—2, 3, or 4
- Texture—sandy clay loam or clay loam
- Clay content—20 to 30 percent
- Content of rock fragments—5 to 35 percent pebbles
- Reaction—pH 6.6 to 7.8

Cabbart Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, knolls, and hills
Parent material: Alluvium and residuum derived from semiconsolidated loamy sedimentary beds
Slope range: 2 to 60 percent
Elevation range: 4,200 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Loamy, mixed, superactive, calcareous, frigid, shallow Aridic Ustorthents

Typical Pedon

Cabbart loam, in an area of Cabbart-Shoddy-Amesha complex, 8 to 15 percent slopes, in rangeland, 1,100 feet south and 375 feet west of the northeast corner of sec. 35, T. 3 N., R. 1 W.

A—0 to 5 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 5 percent rounded pebbles; disseminated lime; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bk1—5 to 9 inches; light gray (10YR 7/2) loam, pale brown (10YR 6/3) moist; weak medium prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; 5 percent rounded pebbles; disseminated lime, common fine threads and masses of lime, common faint lime coatings on pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

Bk2—9 to 18 inches; light gray (10YR 7/2) fine sandy loam, light brownish gray (10YR 6/2) moist; weak coarse prismatic structure; hard, very friable, slightly sticky and slightly plastic; common very fine roots and pores; 5 percent rounded pebbles; disseminated lime, common fine threads and masses of lime, common faint lime coatings on pebbles; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Cr—18 to 60 inches; light gray (10YR 7/2), semiconsolidated loamy sedimentary beds that crush to loam, fine sandy loam, and/or very fine sandy loam.

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the paralithic contact (if it occurs at a depth of less than 12 inches)
Depth to Cr horizon: 10 to 20 inches
Percent of surface covered by stones: 0 to 3 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 3, 4, or 5 moist
- Chroma—2, 3, or 4
- Texture—loam or clay loam
- Clay content—15 to 32 percent
- Content of rock fragments—0 to 50 percent (0 to 20 percent hard cobbles, 0 to 30 percent hard pebbles)
- Calcium carbonate equivalent—5 to 10 percent
- Reaction—pH 7.4 to 9.0

Bk horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, 7, or 8 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—loam, clay loam, silt loam, or fine sandy loam
- Clay content—18 to 35 percent
- Content of rock fragments—0 to 25 percent (0 to 15 percent hard pebbles, 0 to 10 percent soft pebbles)
- Calcium carbonate equivalent—5 to 25 percent
- Reaction—pH 7.4 to 9.0

Cardwell Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat poorly drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour) above the 2C horizon and rapid (6.0 to 20.0 inches per hour) in the 2C horizon
Landform: Flood plains and flood-plain steps
Parent material: Recent alluvium derived from mixed rock sources
Slope range: 0 to 2 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-silty over sandy or sandy-skeletal, mixed, superactive, frigid Oxyaquic Haplustolls

Typical Pedon

Cardwell silty clay loam, in an area of Riverrun-Cardwell complex, 0 to 2 percent slopes, in pasture, 60 feet east and 230 feet south of the northwest corner of sec. 15, T. 1 N., R. 4 W.

A1—0 to 6 inches; grayish brown (10YR 5/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; many very fine and common fine roots; many very fine and common fine pores; disseminated lime; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

A2—6 to 14 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common very fine and few fine roots; many very fine and

few fine pores; disseminated lime; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Bw—14 to 28 inches; light brownish gray (10YR 6/2) loam, dark grayish brown (10YR 4/2) moist; common fine distinct strong brown (7.5YR 4/6) redox concentrations; weak medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; many very fine and few fine pores; disseminated lime; violently effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.

2C1—28 to 36 inches; light brownish gray (10YR 6/2) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 45 percent pebbles; disseminated lime, common faint lime coatings on undersides of fragments; slightly effervescent; moderately alkaline (pH 8.2); gradual smooth boundary.

2C2—36 to 60 inches; pale brown (10YR 6/3) very gravelly loamy sand, brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; 50 percent pebbles; moderately alkaline (pH 8.0).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 10 to 15 inches
Depth to 2C horizon: 20 to 40 inches
Depth to the water table: 24 to 42 inches for extended periods during spring and early summer

A horizon:
- Hue—10YR or 2.5Y
- Value—4 or 5 dry; 2 or 3 moist
- Chroma—2 or 3
- Texture—silty clay loam, loam, or sandy loam
- Clay content—10 to 35 percent
- Content of rock fragments—0 to 15 percent pebbles
- Calcium carbonate equivalent—0 to 10 percent
- Reaction—pH 7.4 to 8.4
- Electrical conductivity—4 to 16 mmhos/cm (saline phase)
- Sodium adsorption ratio—0 to 4 (saline phase)

Bw horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2 or 3
- Texture—loam or silt loam
- Clay content—18 to 27 percent
- Content of rock fragments—0 to 15 percent pebbles
- Calcium carbonate equivalent—0 to 10 percent
- Reaction—pH 7.4 to 8.4
- Electrical conductivity—4 to 16 mmhos/cm (saline phase)
- Sodium adsorption ratio—0 to 8 (saline phase)

2C horizon:
- Hue—10YR, 2.5Y, or 5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2, 3, or 4
- Texture—loamy sand or sand or strata of fine sandy loam, loam, or very fine sandy loam
- Clay content—0 to 10 percent
- Content of rock fragments—35 to 75 percent (0 to 15 percent cobbles, 35 to 60 percent pebbles)
- Calcium carbonate equivalent—0 to 5 percent
- Reaction—pH 6.6 to 8.4
- Electrical conductivity—2 to 8 mmhos/cm (saline phase)

Caseypeak Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Side slopes and ridges of mountains
Parent material: Residuum derived from granite
Slope range: 2 to 60 percent
Elevation range: 5,500 to 8,000 feet
Annual precipitation: 15 to 30 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 30 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Lithic Eutrocryepts

Typical Pedon

Caseypeak gravelly coarse sandy loam, in an area of Caseypeak, very bouldery-Franconi, very bouldery-Rock outcrop complex, 25 to 60 percent slopes; in a forested area, 1,550 feet north and 1,100 feet west of the southeast corner of sec. 19, T. 4 N., R. 3 W.

Oi—1½ inches to 0; forest litter of partially decomposed needles, twigs, and leaves.

E—0 to 5 inches; light brownish gray (10YR 6/2) gravelly coarse sandy loam, brown (10YR 5/3) moist; moderate medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine and common

medium roots; 20 percent granite pebbles; slightly acid (pH 6.2); clear wavy boundary.
Bw1—5 to 11 inches; brown (10YR 5/3) very gravelly coarse sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine and common medium roots; many very fine and few fine pores; 40 percent granite pebbles; neutral (pH 6.6); gradual wavy boundary.
Bw2—11 to 16 inches; pale brown (10YR 6/3) very gravelly coarse sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, common fine, and few medium roots; many very fine and few fine pores; 40 percent granite pebbles; neutral (pH 6.7); clear wavy boundary.
Cr—16 to 19 inches; light yellowish brown (2.5Y 6/4), decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand.
R—19 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 36 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Cr horizon: 10 to 18 inches
Depth to R layer: 12 to 20 inches
Percent of surface covered by stones/boulders: 0 to 50 percent

E horizon:
- Hue—10YR or 2.5Y
- Value—6 or 7 dry; 5 or 6 moist
- Chroma—2 or 3
- Texture—coarse sandy loam, sandy loam, or loamy coarse sand
- Clay content—10 to 20 percent
- Content of rock fragments—10 to 60 percent (0 to 15 percent cobbles and stones, 10 to 50 percent pebbles)
- Reaction—pH 5.6 to 6.5

Bw horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—3 or 4
- Texture—coarse sandy loam, sandy loam, or sandy clay loam
- Clay content—10 to 22 percent
- Content of rock fragments—35 to 60 percent pebbles
- Reaction—pH 6.1 to 7.3

Castner Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Ridges and the upper side slopes of hills
Parent material: Residuum derived from fine grained sandstone or igneous rock
Slope range: 25 to 60 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Lithic Haplustolls

Typical Pedon

Castner very cobbly loam, in an area of Castner, bouldery-Rock outcrop complex, 25 to 50 percent slopes, in rangeland, 350 feet east and 600 feet north of the southwest corner of sec. 21, T. 5 N., R. 2 W.

A—0 to 6 inches; dark grayish brown (10YR 4/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; 15 percent angular cobbles and 25 percent angular pebbles; slightly alkaline (pH 7.8); gradual wavy boundary.
Bk—6 to 12 inches; grayish brown (10YR 5/2) extremely gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many fine and very fine roots; common very fine and fine pores; 20 percent angular cobbles and 50 percent angular pebbles; disseminated lime, common distinct lime crusts on undersides of some fragments; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.
R—12 inches; hard, massive, fine grained sandstone.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)
Thickness of the mollic epipedon: 7 to 12 inches (mixed)
Depth to Bk horizon: 6 to 10 inches
Depth to bedrock: 10 to 20 inches

Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
- Value—3, 4, or 5 dry; 2 or 3 moist
- Chroma—2 or 3
- Clay content—10 to 25 percent
- Content of rock fragments—15 to 55 percent (5 to 25 percent cobbles and stones, 15 to 30 percent pebbles)
- Reaction—pH 6.6 to 8.4

Bk horizon:
- Value—4, 5, or 6 dry; 3, 4, or 5 moist
- Chroma—2 or 3
- Texture—loam or sandy loam
- Clay content—10 to 18 percent
- Content of rock fragments—35 to 80 percent (10 to 25 percent cobbles and stones, 25 to 60 percent pebbles)
- Calcium carbonate equivalent—5 to 15 percent
- Reaction—pH 7.4 to 8.4

Catgulch Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of hills
Parent material: Residuum derived from granite
Slope range: 2 to 70 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Lithic Haplustolls

Typical Pedon

Catgulch gravelly sandy clay loam, in an area of Crackerville-Catgulch, bouldery-Rock outcrop complex, 8 to 25 percent slopes, in rangeland, 1,800 feet north and 600 feet west of the southeast corner of sec. 33, T. 7 N., R. 4 W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) gravelly sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; 20 percent granite pebbles; slightly acid (pH 6.5); clear smooth boundary.

Bw1—5 to 9 inches; brown (10YR 5/3) very gravelly sandy clay loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine and fine pores; 40 percent granite pebbles; neutral (pH 6.6); clear smooth boundary.

Bw2—9 to 12 inches; brown (10YR 5/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine and fine roots; common very fine and fine pores; 45 percent pebbles; slightly acid (pH 6.5); abrupt smooth boundary.

Cr—12 to 15 inches; yellowish brown (10YR 5/4), decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand.

R—15 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 12 inches
Depth to Cr horizon: 10 to 18 inches
Depth to R layer: 12 to 20 inches
Percent of surface covered by stones/boulders: 0 to 15 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—3 or 4 dry; 2 or 3 moist
- Chroma—2 or 3
- Texture—sandy loam, sandy clay loam, or coarse sandy loam
- Clay content—12 to 24 percent
- Content of rock fragments—5 to 50 percent (0 to 20 percent cobbles and stones, 5 to 30 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bw horizon:
- Hue—10YR or 2.5Y
- Value—4 or 5 dry; 3 or 4 moist
- Chroma—3, 4, or 6
- Texture—sandy loam, coarse sandy loam, or sandy clay loam
- Clay content—10 to 22 percent
- Content of rock fragments—35 to 60 percent (5 to 20 percent cobbles and stones, 30 to 40 percent pebbles)
- Reaction—pH 6.1 to 7.3

Cedric Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Ridges and hills
Parent material: Residuum derived from granite
Slope range: 2 to 35 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 12 to 17 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 95 days

Taxonomic classification: Loamy, mixed, superactive, frigid Lithic Argiustolls

Typical Pedon

Cedric coarse sandy loam, in an area of Cedric, bouldery-Rock outcrop-Jeffcity, bouldery, complex, 2 to 15 percent slopes, in rangeland, 1,100 feet north and 900 feet west of the southeast corner of sec. 18, T. 1 N., R. 5 W.

A—0 to 5 inches; dark grayish brown (10YR 4/2) coarse sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; 10 percent granite pebbles; neutral (pH 6.8); clear wavy boundary.

Bt—5 to 11 inches; brown (10YR 4/3) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine pores; common faint dark grayish brown (10YR 4/2) clay films on faces of peds and bridging sand grains; 20 percent granite pebbles; neutral (pH 7.0); clear wavy boundary.

Bk—11 to 15 inches; light brownish gray (10YR 6/2) very gravelly coarse sandy loam, grayish brown (10YR 5/2) moist; moderate coarse prismatic structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; common very fine and fine pores; 40 percent granite pebbles; disseminated lime, common fine masses and threads of lime, common distinct lime coatings on rock fragments; violently effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Cr—15 to 18 inches; brown (10YR 5/3), partially decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand.

R—18 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between a depth of 8 inches and the lithic contact
Depth to Bk horizon: 8 to 13 inches
Depth to Bt horizon: 5 to 8 inches
Depth to Cr horizon: 10 to 17 inches
Depth to R layer: 12 to 20 inches
Percent of surface covered by stones/boulders: 0 to 0.1 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Clay content—5 to 15 percent
Content of rock fragments—5 to 15 percent pebbles
Reaction—pH 6.6 to 7.8

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Clay content—10 to 18 percent
Content of rock fragments—10 to 30 percent pebbles
Reaction—pH 6.6 to 7.8

Bk horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 5 or 6 moist
Chroma—2 or 3
Clay content—5 to 18 percent
Content of rock fragments—15 to 45 percent pebbles
Calcium carbonate equivalent—5 to 20 percent
Reaction—pH 7.4 to 8.4

Cheadle Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of mountains
Parent material: Residuum derived from hard, fine grained sandstone or igneous rock
Slope range: 4 to 50 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F

Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Lithic Haplocryolls

Typical Pedon

Cheadle very gravelly loam, in an area of Cheadle, very stony-Rock outcrop-Tiban, bouldery, complex, 15 to 45 percent slopes, in rangeland, 950 feet west and 1,500 feet north of the southeast corner of sec. 4, T. 5 N., R. 2 E.

A—0 to 4 inches; dark brown (10YR 3/3) very gravelly loam, very dark brown (10YR 2/2) moist; moderate fine and very fine granular structure; soft, very friable, slightly sticky and nonplastic; many fine and very fine roots; 5 percent angular cobbles and 50 percent angular pebbles; neutral (pH 6.6); clear wavy boundary.

Bw1—4 to 11 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; strong fine and very fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots and common medium roots; 10 percent angular cobbles and 45 percent angular pebbles; neutral (pH 6.8); clear wavy boundary.

Bw2—11 to 15 inches; dark yellowish brown (10YR 4/4) extremely gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many fine and very fine roots and common medium roots; 15 percent angular cobbles and 55 percent angular pebbles; neutral (pH 7.0); clear wavy boundary.

Bk—15 to 18 inches; brown (10YR 5/3) extremely gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common fine and very fine roots matted between rock fragments; 20 percent angular cobbles and 50 percent angular pebbles; disseminated lime, continuous faint lime coatings on undersides of rock fragments; strongly effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.

R—18 inches; pale brown (10YR 6/3), fractured, hard, fine grained sandstone.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)
Thickness of the mollic epipedon: 7 to 12 inches
Depth to Bk horizon: 12 to 16 inches
Depth to bedrock: 10 to 20 inches
Percent of surface covered by stones/boulders: 0.1 to 3.0 percent

A horizon:
- Hue—2.5Y or 10YR
- Value—3, 4, or 5 dry; 2 or 3 moist
- Chroma—2 or 3
- Clay content—15 to 27 percent
- Content of rock fragments—15 to 60 percent (5 to 30 percent cobbles and stones; 5 to 50 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bw horizon:
- Hue—2.5Y or 10YR
- Value—4 or 5 dry; 2 or 3 moist
- Chroma—2, 3, or 4
- Texture—loam or sandy loam
- Clay content—15 to 25 percent
- Content of rock fragments—35 to 70 percent (10 to 30 percent cobbles and stones, 25 to 55 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bk horizon:
- Hue—2.5Y or 10YR
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—3 or 4
- Clay content—10 to 25 percent
- Content of rock fragments—35 to 75 percent (20 to 35 percent cobbles and stones, 15 to 50 percent pebbles)
- Calcium carbonate equivalent—3 to 10 percent
- Reaction—pH 7.4 to 8.4

Chinook Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Alluvial fans, stream terraces, footslopes, and side slopes of hills
Parent material: Sandy alluvium or eolian deposits
Slope range: 0 to 25 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls

Typical Pedon

Chinook sandy loam, 2 to 8 percent slopes, in rangeland, 1,200 feet west and 500 feet south of the northeast corner of sec. 28, T. 1 N., R. 1 W.

A—0 to 7 inches; brown (10YR 4/3) sandy loam, dark brown (10YR 3/3) moist; weak fine and very fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; slightly alkaline (pH 7.8); abrupt smooth boundary.

Bw—7 to 15 inches; brown (10YR 4/3) sandy loam, dark brown (10YR 3/3) moist; weak fine prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, very friable, nonsticky and nonplastic; many fine roots; many very fine pores; slightly alkaline (pH 7.8); clear smooth boundary.

Bk1—15 to 54 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; weak coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; few fine roots; few very fine pores; disseminated lime, common fine threads and masses of lime; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

Bk2—54 to 60 inches; pale brown (10YR 6/3) sandy loam, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots; few very fine pores; disseminated lime, few fine threads of lime; violently effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bk horizon: 10 to 25 inches

A horizon:
- Value—2 or 3 moist
- Chroma—2 or 3
- Texture—sandy loam or sandy clay loam
- Clay content—10 to 27 percent
- Content of rock fragments—0 to 15 percent pebbles
- Calcium carbonate equivalent—0 to 5 percent
- Reaction—pH 6.6 to 7.8; pH 7.9 to 9.0 in the saline phase
- Electrical conductivity—4 to 16 mmhos/cm (saline phase)
- Sodium adsorption ratio—0 to 8 (saline phase)

Bw horizon:
- Hue—10YR or 2.5Y
- Value—4, 5, or 6 dry; 3, 4, or 5 moist
- Chroma—2, 3, or 4
- Texture—fine sandy loam or sandy loam
- Clay content—5 to 18 percent
- Content of rock fragments—0 to 15 percent pebbles
- Calcium carbonate equivalent—0 to 5 percent
- Reaction—pH 6.6 to 8.4; pH 8.5 to 9.0 in the saline phase
- Electrical conductivity—8 to 16 mmhos/cm (saline phase)
- Sodium adsorption ratio—4 to 13 (saline phase)

Bk horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4 or 5 moist
- Chroma—2, 3, or 4
- Clay content—5 to 18 percent
- Content of rock fragments—0 to 15 percent pebbles
- Calcium carbonate equivalent—5 to 15 percent
- Reaction—pH 7.4 to 8.4; pH 8.5 to 9.0 in the saline phase
- Electrical conductivity—2 to 16 mmhos/cm (saline phase)
- Sodium adsorption ratio—0 to 13 (saline phase)

Clancy Series

Depth class: Moderately deep (20 to 40 inches) to weathered granite bedrock and deep (40 to 60 inches) to hard granite bedrock
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, hills, and ridges
Parent material: Local colluvium and residuum derived from granite
Slope range: 2 to 45 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Clancy sandy clay loam, in an area of Burtoner-Clancy-Connieo complex, 4 to 15 percent slopes, in rangeland, 800 feet south and 1,100 feet west of the northeast corner of sec. 30, T. 9 N., R. 2 W.

A—0 to 8 inches; dark brown (10YR 3/3) sandy clay loam, very dark brown (10YR 2/2) moist; weak

medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine and fine pores; 10 percent granite pebbles; neutral (pH 7.0); clear smooth boundary.

Bt1—8 to 15 inches; yellowish brown (10YR 5/4) gravelly sandy clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; many very fine and few fine roots; many very fine and few fine pores; many faint clay films bridging sand grains and on faces of peds; 20 percent granite pebbles; neutral (pH 6.9); clear smooth boundary.

Bt2—15 to 22 inches; light olive brown (2.5Y 5/4) gravelly sandy clay loam, olive brown (2.5Y 4/4) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine and few fine pores; common faint clay films bridging sand grains and on faces of peds; 25 percent granite pebbles; neutral (pH 6.8); clear wavy boundary.

BC—22 to 30 inches; olive brown (2.5Y 4/4) gravelly coarse sandy loam, dark grayish brown (2.5Y 4/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; common very fine pores; 30 percent granite pebbles; neutral (pH 6.6); clear irregular boundary.

Cr—30 to 55 inches; olive gray (5Y 5/2), decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand.

R—55 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bt horizon: 6 to 12 inches
Depth to Cr horizon: 20 to 40 inches
Depth to R layer: 40 to 60 inches
Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—3 or 4 dry; 2 or 3 moist
- Chroma—2 or 3
- Texture—loam, sandy loam, coarse sandy loam, or sandy clay loam
- Clay content—15 to 25 percent
- Content of rock fragments—5 to 25 percent pebbles
- Reaction—pH 6.1 to 7.3

Bt horizon:
- Hue—10YR or 2.5Y
- Value—4 or 5 dry; 3 or 4 moist
- Chroma—3, 4, or 6
- Texture—sandy clay loam or clay loam
- Clay content—20 to 30 percent
- Content of rock fragments—10 to 35 percent pebbles
- Reaction—pH 6.6 to 7.3

BC horizon:
- Hue—10YR or 2.5Y
- Value—4, 5, or 6 dry; 4 or 5 moist
- Chroma—2, 3, 4, or 6
- Texture—coarse sandy loam or sandy loam
- Clay content—10 to 18 percent
- Content of rock fragments—10 to 35 percent pebbles
- Reaction—pH 6.1 to 7.3

Clasoil Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans and sides of hills
Parent material: Alluvium derived mainly from granite
Slope range: 2 to 35 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Clasoil gravelly loam, in an area of Sawicki-Clasoil complex, 8 to 35 percent slopes, bouldery, warm, in rangeland, 500 feet north and 1,000 feet east of the southwest corner of sec. 13, T. 9 N., R. 2 W.

A1—0 to 5 inches; very dark grayish brown (10YR 3/2) gravelly loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine and medium roots; 5 percent cobbles, 10 percent pebbles; slightly acid (pH 6.2); clear smooth boundary.

A2—5 to 13 inches; dark grayish brown (10YR 4/2)

gravelly loam, very dark gray (10YR 3/1) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many very fine and few fine and medium roots; many very fine and common fine pores; 5 percent cobbles, 25 percent pebbles; slightly acid (pH 6.2); clear smooth boundary.

Bt1—13 to 24 inches; light yellowish brown (10YR 6/4) gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, moderately sticky and moderately plastic; common very fine roots and few fine and medium roots; common very fine and fine pores; common distinct clay films on faces of peds and bridging sand grains; 5 percent cobbles, 15 percent pebbles; neutral (pH 6.7); clear smooth boundary.

Bt2—24 to 34 inches; light yellowish brown (2.5Y 6/4) cobbly sandy clay loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; common very fine and few fine and medium roots; common very fine and few fine pores; common distinct clay films on faces of peds and bridging sand grains; 20 percent cobbles, 10 percent pebbles; neutral (pH 6.7); clear smooth boundary.

BC—34 to 60 inches; light yellowish brown (10YR 6/4) very cobbly loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; 25 percent cobbles, 15 percent pebbles; neutral (pH 6.6).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bt horizon: 7 to 22 inches
Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—2, 3, or 4 dry; 2 or 3 moist
- Chroma—1, 2, or 3
- Texture—loam or sandy loam
- Clay content—12 to 20 percent
- Content of rock fragments—0 to 35 percent (0 to 10 percent cobbles and stones, 0 to 25 percent pebbles)
- Reaction—pH 5.6 to 7.3

Bt horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2, 3, or 4
- Texture—sandy clay loam, loam, or clay loam
- Clay content—18 to 30 percent
- Content of rock fragments—5 to 35 percent (0 to 20 percent stones and cobbles, 5 to 30 percent pebbles)
- Reaction—pH 5.6 to 7.3

BC horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—3, 4, or 6
- Texture—sandy loam, loam, or coarse sandy loam
- Clay content—12 to 20 percent
- Content of rock fragments—15 to 40 percent (0 to 25 percent stones and cobbles, 15 to 35 percent pebbles)
- Reaction—pH 6.1 to 7.8

Clugulch Series

Depth class: Very shallow (0 to 10 inches)
Drainage class: Well drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Ridges and side slopes of mountains
Parent material: Residuum derived from granite
Slope range: 2 to 70 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy, mixed, superactive Lithic Eutrocryepts

Typical Pedon

Clugulch sandy loam, in an area of Branham-Clugulch-Rock outcrop complex, 2 to 15 percent slopes; in a forested area, 2,000 feet south and 1,350 feet west of the northeast corner of sec. 5, T. 1 S., R. 6 W.

Oi—2 inches to 0; forest litter of partially decomposed twigs, needles, and lichens.

A—0 to 3 inches; dark grayish brown (10YR 4/2) sandy loam, black (10YR 2/1) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; 10 percent granite pebbles; neutral (pH 6.7); clear wavy boundary.

Bw—3 to 7 inches; light brownish gray (10YR 6/2) gravelly coarse sandy loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; many very fine and fine roots; 20 percent granite pebbles; slightly acid (pH 6.5); abrupt wavy boundary.
Cr—7 to 9 inches; light brownish gray (10YR 6/2), decomposing granite (grus) that textures to gravelly loamy sand.
R—9 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between a depth of 4 inches and the lithic contact
Depth to Cr horizon: Less than 10 inches
Depth to R layer: Less than 10 inches
Percent of surface covered by stones/boulders: 0 to 0.1 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry
Chroma—1, 2, or 3
Texture—sandy loam or coarse sandy loam
Clay content—10 to 18 percent
Content of rock fragments—0 to 25 percent pebbles
Reaction—pH 6.1 to 7.3

Bw horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Texture—coarse sandy loam or sandy loam
Clay content—5 to 15 percent
Content of rock fragments—5 to 35 percent pebbles
Reaction—pH 6.1 to 7.3

Clunton Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Very poorly drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Flood plains and flood-plain steps
Parent material: Recent alluvium derived from mixed rock sources
Slope range: 0 to 4 percent
Elevation range: 3,800 to 5,500 feet
Annual precipitation: 10 to 17 inches
Annual air temperature: 38 to 44 degrees F
Frost-free period: 80 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Fluvaquentic Endoaquolls

Typical Pedon

Clunton silty clay loam, 0 to 2 percent slopes, in a grass hay meadow, 1,600 feet north and 1,200 feet west of the southeast corner of sec. 30, T. 4 N., R. 2 W.

Oe—4 inches to 0; very dark gray (5Y 3/1) mucky peat, very dark gray (5Y 3/1) dry; neutral (pH 6.8); abrupt smooth boundary.
Ag—0 to 14 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; many distinct black (5Y 2.5/1) redox depletions; few faint strong brown (7.5YR 5/6) redox concentrations; moderate medium prismatic structure; hard, firm, moderately sticky and moderately plastic; common very fine roots; common very fine and fine pores; neutral (pH 7.0); abrupt smooth boundary.
Cg1—14 to 26 inches; very dark gray (5Y 3/1) silty clay loam, dark gray (5Y 4/1) dry; common faint very dark gray (5Y 3/1) redox depletions; many distinct strong brown (7.5YR 5/6) redox concentrations; massive; hard, firm, moderately sticky and moderately plastic; common very fine roots; few very fine pores; neutral (pH 7.2); clear wavy boundary.
Cg2—26 to 30 inches; very dark gray (5Y 3/1) loam consisting of strata of loam and sandy loam, dark gray (5Y 4/1) dry; common distinct strong brown (7.5YR 5/6) redox concentrations; common faint very dark gray (5Y 3/1) redox depletions; massive; hard, friable, slightly sticky and slightly plastic; few very fine roots; neutral (pH 7.2); gradual wavy boundary.
Cg3—30 to 38 inches; dark gray (5Y 4/1) silty clay loam consisting of strata of silty clay loam and sandy loam, gray (5Y 5/1) dry; common distinct strong brown (7.5YR 5/6) redox concentrations; common faint very dark gray (5Y 3/1) redox depletions; massive; slightly hard, friable, slightly sticky and slightly plastic; neutral (pH 7.0); gradual wavy boundary.
2Cg4—38 to 60 inches; dark gray (10YR 4/1) gravelly sandy loam, grayish brown (2.5Y 5/2) dry; many distinct strong brown (7.5YR 5/6) redox concentrations; few faint very dark gray (5Y 3/1) redox depletions; massive; slightly hard, friable, slightly sticky and nonplastic; 15 percent pebbles; neutral (pH 7.0).

Range in Characteristics

Soil temperature: 40 to 46 degrees F

Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 10 to 24 inches
Water table: At the surface to 12 inches below the surface for extended periods during spring and summer

Ag horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—1 or 2
Texture—silty clay loam, loam, or silt loam
Clay content—15 to 30 percent
Reaction—pH 6.1 to 7.3

Cg1 horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5 dry
Chroma—1 or 2
Texture—silty clay loam, loam, silt loam, or clay loam
Clay content—18 to 35 percent
Content of rock fragments—0 to 10 percent pebbles
Reaction—pH 6.6 to 7.8

Cg2 and Cg3 horizons:
Hue—2.5Y or 5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Texture—silt loam, loam, clay loam, or silty clay loam with thin strata of finer and coarser materials
Clay content—18 to 35 percent
Content of rock fragments—0 to 10 percent pebbles
Reaction—pH 6.6 to 7.8

2Cg4 horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—4 or 5 dry; 3 or 4 moist
Chroma—0 to 2
Texture—sandy loam or loam with strata of loamy sand, silt loam, or very fine sandy loam
Clay content—5 to 25 percent
Content of rock fragments—0 to 25 percent pebbles
Reaction—pH 6.6 to 7.8

Cometcrik Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Poorly drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Flood plains, flood-plain steps, and drainageways
Parent material: Recent alluvium derived from mixed rock sources
Slope range: 0 to 8 percent
Elevation range: 4,600 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Cumulic Endoaquolls

Typical Pedon

Cometcrik loam, in an area of Breeton-Cometcrik complex, 2 to 8 percent slopes, in rangeland, 2,000 feet north and 2,100 feet west of the southeast corner of sec. 13, T. 7 N., R. 4 W.

A—0 to 12 inches; black (10YR 2/1) loam, very dark gray (10YR 3/1) dry; moderate fine granular structure; hard, very friable, moderately sticky and slightly plastic; many very fine and fine and common medium roots; neutral (pH 6.8); gradual smooth boundary.
Bw—12 to 24 inches; black (10YR 2/1) loam, very dark grayish brown (10YR 3/2) dry; few fine distinct yellowish red (5YR 4/6) (dry) redox concentrations; weak medium subangular blocky structure; very hard, very friable, moderately sticky and slightly plastic; many very fine roots and common fine and medium roots; many very fine and common fine pores; neutral (pH 6.8); clear smooth boundary.
Cg1—24 to 42 inches; very dark gray (10YR 3/1) silty clay loam, grayish brown (2.5Y 5/2) dry; common fine distinct yellowish red (5YR 4/6) (dry) redox concentrations; massive; extremely hard, firm, very sticky and moderately plastic; few very fine and fine roots; few very fine and fine pores; 5 percent pebbles; neutral (pH 7.0); gradual wavy boundary.
2Cg2—42 to 58 inches; brown (10YR 5/3) gravelly loamy coarse sand, pale brown (10YR 6/3) dry; massive; hard, very friable, nonsticky and nonplastic; 30 percent pebbles; neutral (pH 7.0); clear wavy boundary.
3Cg3—58 to 60 inches; dark gray (10YR 4/1) loam consisting of fine strata of very fine sandy loam and silty clay loam, grayish brown (10YR 5/2) dry; common medium distinct strong brown (7.5YR 5/6) (dry) redox concentrations; massive; very hard, friable, moderately sticky and slightly plastic; 5 percent pebbles; neutral (pH 7.0).

Range in Characteristics

Soil temperature: 38 to 42 degrees F

Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 24 to 60 inches
Depth to seasonal high water table: 12 to 24 inches during the spring and early summer
Depth to 2Cg horizon: 40 to 60 inches

A horizon:
Hue—10YR or 2.5Y
Value—3 or 4 dry; 2 or 3 moist
Chroma—1 or 2
Clay content—18 to 27 percent
Content of rock fragments—0 to 10 percent pebbles
Reaction—pH 6.1 to 7.3

Bw horizon:
Hue—10YR or 2.5Y
Value—3 or 4 dry; 2 or 3 moist
Chroma—1 or 2
Texture—loam, silt loam, or silty clay loam
Clay content—18 to 35 percent
Content of rock fragments—0 to 10 percent pebbles
Reaction—pH 6.1 to 7.3

Cg horizon:
Hue—10YR, 7.5YR, or 2.5Y
Value—4, 5, or 6 dry; 2 or 3 moist
Chroma—1 or 2
Texture—loam, silt loam, or silty clay loam
Clay content—18 to 35 percent clay
Content of rock fragments—0 to 10 percent pebbles
Reaction—pH 6.1 to 7.3

2Cg horizon:
Hue—10YR, 7.5YR, or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—1, 2, or 3
Texture—coarse sand, loamy coarse sand, or coarse sandy loam
Clay content—2 to 10 percent clay
Content of rock fragments—15 to 35 percent pebbles
Reaction—pH 6.1 to 7.3

3Cg horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—1 or 2
Texture—stratified fine sandy loam to silty clay loam
Clay content—10 to 35 percent
Content of rock fragments—0 to 35 percent (0 to 5 percent cobbles, 0 to 30 percent pebbles)
Reaction—pH 6.1 to 7.8

Connieo Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of hills
Parent material: Residuum derived from granite
Slope range: 2 to 60 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy, mixed, superactive, frigid Lithic Argiustolls

Typical Pedon

Connieo sandy clay loam, in an area of Burtoner-Connieo, bouldery-Rock outcrop complex, 4 to 15 percent slopes, in rangeland, 2,400 feet south and 100 feet west of the northeast corner of sec. 11, T. 5 N., R. 4 W.

A—0 to 8 inches; dark grayish brown (10YR 4/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; 5 percent granite pebbles; neutral (pH 7.2); clear smooth boundary.
Bt—8 to 14 inches; brown (10YR 5/3) gravelly sandy clay loam, brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; common very fine and few fine roots; many very fine and few fine pores; common faint clay films on faces of peds and bridging sand grains; 25 percent granite pebbles; slightly alkaline (pH 7.6); clear smooth boundary.
Cr—14 to 18 inches; light brownish gray (2.5Y 6/2), decomposing granite bedrock (grus) that crushes to very gravelly loamy coarse sand.
R—18 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)
Thickness of the mollic epipedon: 7 to 12 inches
Depth to Bt horizon: 5 to 12 inches
Depth to Cr horizon: 10 to 18 inches

Depth to R layer: 12 to 20 inches
Percent of surface covered by stones/boulders: 0 to 15 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 2 or 3 moist
Chroma—2 or 3
Texture—coarse sandy loam, sandy loam, or sandy clay loam
Clay content—14 to 24 percent
Content of rock fragments—5 to 60 percent (0 to 15 percent stones and cobbles, 5 to 50 percent pebbles)
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 3 or 4 moist
Chroma—2, 3, or 4
Clay content—20 to 30 percent
Content of rock fragments—10 to 35 percent pebbles
Reaction—pH 6.1 to 7.8

Cowood Family

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of mountains
Parent material: Residuum derived from fine grained sandstone and igneous rock
Slope range: 4 to 70 percent
Elevation range: 5,500 to 8,500 feet
Annual precipitation: 15 to 30 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 30 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Lithic Eutrocryepts

Typical Pedon

Cowood extremely cobbly loam, in an area of Warwood-Tigeron, very stony-Cowood, very stony, complex, 25 to 60 percent slopes; in a forested area, 400 feet south and 950 feet east of the northwest corner of sec. 4, T. 8 N., R. 4 W.

Oi—2 inches to 0; forest litter of partially decomposed needles and twigs.
A—0 to 4 inches; grayish brown (10YR 5/2) extremely cobbly loam, dark grayish brown (10YR 4/2) moist; weak very fine and fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine and few medium roots; 50 percent cobbles and 15 percent pebbles; neutral (pH 6.8); clear smooth boundary.
Bw—4 to 17 inches; pale brown (10YR 6/3) extremely cobbly loam, brown (10YR 4/3) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine pores; 50 percent cobbles and 20 percent pebbles; neutral (pH 6.7); abrupt wavy boundary.
R—17 inches; hard, fine grained igneous bedrock.

Range in Characteristics

Soil temperature: 36 to 40 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)
Depth to bedrock: 10 to 20 inches
Percent of surface covered by stones/boulders: 0 to 30 percent

A horizon:
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Texture—loam or sandy loam
Clay content—10 to 27 percent
Content of rock fragments—25 to 70 percent (10 to 50 percent cobbles and stones, 15 to 40 percent pebbles or channers)
Reaction—pH 5.6 to 7.3

Bw horizon:
Value—5 or 6 dry; 4 or 5 moist
Chroma—3, 4, or 6
Texture—loam or sandy loam
Clay content—5 to 25 percent
Content of rock fragments—60 to 80 percent (25 to 60 percent cobbles and stones, 20 to 35 percent pebbles)
Reaction—pH 5.1 to 7.3

Cozberg Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Alluvial fans, stream terraces, and valley floors
Parent material: Alluvium
Slope range: 0 to 15 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches

Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls

Typical Pedon

Cozberg sandy loam, 2 to 8 percent slopes, in rangeland, 2,000 feet south and 2,200 feet west of the northeast corner of sec. 28, T. 1 N., R. 1 W.

A—0 to 5 inches; brown (10YR 4/3) sandy loam, dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and very fine roots; moderately alkaline (pH 8.0); abrupt smooth boundary.

Bw1—5 to 8 inches; brown (10YR 5/3) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; common fine pores; 15 percent pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bw2—8 to 19 inches; pale brown (10YR 6/3) fine sandy loam, brown (10YR 5/3) moist; moderate medium and coarse prismatic structure; slightly hard, friable, slightly sticky and nonplastic; common fine and very fine roots; common fine and medium pores; disseminated lime, few fine threads and masses of lime; slightly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bk1—19 to 28 inches; very pale brown (10YR 7/3) loam, light brownish gray (10YR 6/2) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and nonplastic; few fine and very fine roots; common fine pores; 5 percent pebbles; disseminated lime, common fine threads and masses of lime, few faint lime coatings on pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

2Bk2—28 to 36 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; 30 percent pebbles; disseminated lime, common medium threads and masses of lime, continuous distinct lime crusts on pebbles; strongly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

2C—36 to 60 inches; yellowish brown (10YR 5/6) gravelly loamy sand, yellowish brown (10YR 5/6) moist; single grain; loose; nonsticky and nonplastic; few very fine and fine roots; 30 percent pebbles; moderately alkaline (pH 8.0).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Thickness of the mollic epipedon: 7 to 12 inches
Depth to Bk horizon: 8 to 16 inches
Percent of surface covered by stones: 0 to 0.1 percent

A horizon:
- Value—2 or 3 moist
- Chroma—2 or 3
- Clay content—10 to 20 percent
- Content of rock fragments—0 to 15 percent pebbles
- Reaction—pH 7.4 to 8.4

Bw horizon:
- Value—5 or 6 dry; 3, 4, or 5 moist
- Chroma—2 or 3
- Texture—fine sandy loam or sandy loam
- Clay content—10 to 18 percent
- Content of rock fragments—0 to 15 percent pebbles
- Reaction—pH 7.4 to 8.4

Bk1 horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Clay content—10 to 18 percent
- Content of rock fragments—0 to 15 percent pebbles
- Calcium carbonate equivalent—5 to 15 percent
- Reaction—pH 7.4 to 8.4

2Bk2 horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Clay content—0 to 10 percent
- Content of rock fragments—0 to 30 percent pebbles
- Calcium carbonate equivalent—15 to 35 percent
- Reaction—pH 7.4 to 8.4

2C horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, 4, or 6
- Clay content—0 to 10 percent
- Content of rock fragments—0 to 35 percent pebbles

Calcium carbonate equivalent—0 to 10 percent
Reaction—pH 7.4 to 8.4

Crackerville Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of hills
Parent material: Local colluvium, slope alluvium, and residuum derived from granite
Slope range: 2 to 60 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Crackerville loam, in an area of Crackerville-Catgulch complex, 2 to 15 percent slopes, bouldery, in rangeland, 600 feet south and 800 feet east of the northwest corner of sec. 16, T. 5 N., R. 2 W.

A—0 to 7 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; 10 percent granite pebbles; slightly acid (pH 6.2); clear smooth boundary.
Bt—7 to 15 inches; yellowish brown (10YR 5/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium and coarse prismatic structure parting to moderate medium and coarse subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and few fine roots; common very fine and fine pores; common faint clay films on faces of peds and bridging sand grains; 40 percent pebbles; neutral (pH 7.2); clear wavy boundary.
BC—15 to 23 inches; pale brown (10YR 6/3) gravelly coarse sandy loam, brown (10YR 4/3) moist; weak coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine and few fine pores; 30 percent pebbles; neutral (pH 7.2); clear wavy boundary.
Cr—23 to 31 inches; very pale brown (10YR 7/3), decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand.
R—31 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bt horizon: 7 to 15 inches
Depth to Cr horizon: 20 to 38 inches
Depth to R layer: 23 to 40 inches
Percent of surface covered by stones/boulders: 0 to 0.1 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 2 or 3 moist
Chroma—2 or 3
Texture—sandy clay loam, loam, or coarse sandy loam
Clay content—14 to 27 percent
Content of rock fragments—0 to 35 percent (0 to 15 percent stones and cobbles, 5 to 20 percent pebbles)
Reaction—pH 5.1 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 3 or 4 moist
Chroma—3, 4, or 6 dry
Clay content—20 to 30 percent
Content of rock fragments—35 to 60 percent (0 to 15 percent cobbles, 35 to 45 percent pebbles)
Reaction—pH 6.6 to 7.8

BC horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—3, 4, or 6 dry
Texture—sandy loam, coarse sandy loam, or loamy coarse sand
Clay content—5 to 15 percent
Content of rock fragments—30 to 70 percent (0 to 15 percent cobbles, 30 to 55 percent pebbles)
Reaction—pH 6.6 to 7.8

Crago Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, escarpments, plains, and side slopes of hills
Parent material: Alluvium or colluvium derived mainly from limestone

Slope range: 1 to 60 percent
Elevation range: 3,800 to 5,500 feet
Annual precipitation: 10 to 15 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 80 to 115 days

Taxonomic classification: Loamy-skeletal, carbonatic, frigid Aridic Calciustepts

Typical Pedon

Crago gravelly loam, 2 to 8 percent slopes, in rangeland, 750 feet south and 3,350 feet east of the northwest corner of sec. 8, T. 3 N., R. 1 W.

A—0 to 4 inches; brown (10YR 5/3) gravelly loam, brown (10YR 4/3) moist; moderate fine and medium granular structure; soft, very friable, slightly sticky and nonplastic; many very fine roots; 20 percent pebbles; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

Bk1—4 to 12 inches; yellowish brown (10YR 5/4) gravelly loam, brown (10YR 5/3) moist; weak medium and coarse prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; few fine pores; 25 percent pebbles; disseminated lime, continuous prominent lime crusts on undersides of pebbles; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bk2—12 to 20 inches; very pale brown (10YR 7/3) gravelly clay loam, pale brown (10YR 6/3) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; few fine pores; 35 percent pebbles; disseminated lime, common medium masses and threads of lime, continuous prominent lime crusts on pebbles; violently effervescent; moderately alkaline (pH 8.4); gradual irregular boundary.

Bk3—20 to 50 inches; white (10YR 8/2) very gravelly loam, pale brown (10YR 6/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; 5 percent cobbles, 40 percent pebbles; disseminated lime, many fine masses and threads of lime, continuous prominent lime crusts on pebbles; violently effervescent; strongly alkaline (pH 8.6); gradual irregular boundary.

2C—50 to 60 inches; light gray (10YR 7/2) very gravelly sandy loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; very few fine roots; 10 percent cobbles, 45 percent pebbles; disseminated lime; violently effervescent; strongly alkaline (pH 8.6).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Percent of surface covered by stones/boulders: 0 to 20 percent

A horizon:
- Value—4, 5, or 6 dry; 3, 4, or 5 moist
- Chroma—2 or 3
- Clay content—15 to 27 percent
- Content of rock fragments—0 to 60 percent (0 to 30 percent stones and cobbles, 0 to 45 percent pebbles)
- Calcium carbonate equivalent—3 to 15 percent
- Reaction—pH 7.4 to 8.4

Bk1 horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, 7, or 8 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—loam or sandy loam
- Clay content—15 to 27 percent
- Content of rock fragments—15 to 75 percent (0 to 30 percent stones and cobbles, 15 to 60 percent pebbles)
- Calcium carbonate equivalent—40 to 70 percent
- Reaction—pH 7.4 to 9.0

Bk2 and Bk3 horizons:
- Hue—2.5Y or 10YR
- Value—6, 7, or 8 dry; 4, 5, 6, or 7 moist
- Chroma—2, 3, or 4
- Texture—loam, clay loam, or sandy loam
- Clay content—15 to 35 percent
- Content of rock fragments—35 to 75 percent (0 to 30 percent stones and cobbles, 35 to 45 percent pebbles)
- Calcium carbonate equivalent—40 to 70 percent
- Reaction—pH 7.4 to 9.0

2C horizon:
- Hue—2.5Y or 10YR
- Value—6, 7, or 8 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—loamy sand, coarse sandy loam, or sandy loam
- Clay content—0 to 20 percent
- Content of rock fragments—40 to 80 percent (0 to 40 percent stones and cobbles, 40 to 80 percent pebbles)
- Calcium carbonate equivalent—15 to 50 percent
- Reaction—pH 7.4 to 9.0

Crampton Series

Depth class: Moderately deep (20 to 40 inches) to weathered granite bedrock and deep (40 to 60 inches) to hard granite bedrock
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and hills
Parent material: Local colluvium, slope alluvium, and residuum derived from hard, fine grained and coarse grained igneous rocks deposited over granite bedrock
Slope range: 15 to 60 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Crampton very cobbly sandy loam, in an area of Sawicki, very bouldery-Crampton, bouldery-Catgulch, bouldery, complex, 15 to 45 percent slopes, in rangeland, 100 feet north and 450 feet east of the southwest corner of sec. 35, T. 8 N., R. 4 W.

A—0 to 11 inches; dark grayish brown (10YR 4/2) very cobbly sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots and few fine and medium roots; many very fine and fine pores; 25 percent angular cobbles and 20 percent angular pebbles; neutral (pH 7.2); gradual wavy boundary.
Bt1—11 to 21 inches; yellowish brown (10YR 5/4) very cobbly sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many very fine roots and few fine and medium roots; many very fine and fine pores; many faint clay films on faces of peds and bridging sand grains; 25 percent angular cobbles and 20 percent angular pebbles; neutral (pH 7.3); gradual wavy boundary.
Bt2—21 to 30 inches; brown (10YR 5/3) very cobbly coarse sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; many very fine and fine pores; common faint clay films bridging sand grains; 25 percent angular cobbles and 30 percent angular pebbles; neutral (pH 7.1); clear wavy boundary.
BC—30 to 35 inches; pale brown (10YR 6/3) gravelly coarse sandy loam, brown (10YR 5/3) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; 30 percent granite pebbles; neutral (pH 6.8); clear wavy boundary.
Cr—35 to 59 inches; yellowish brown (10YR 5/4), decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand.
R—59 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bt horizon: 7 to 13 inches
Depth to Cr horizon: 20 to 40 inches
Depth to R layer: 40 to 60 inches
Percent of surface covered by stones/boulders: 1 to 5 percent

A horizon:
Hue—10YR or 2.5Y
Value—3 or 4 dry; 2 or 3 moist;
Chroma—1, 2, or 3
Texture—sandy loam, sandy clay loam, or coarse sandy loam
Clay content—10 to 25 percent
Content of rock fragments—0 to 60 percent (0 to 30 percent cobbles and stones, 0 to 30 percent pebbles)
Reaction—pH 6.6 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—coarse sandy loam, sandy clay loam, or loam
Clay content—18 to 30 percent
Content of rock fragments—35 to 60 percent (10 to 30 percent cobbles and stones, 20 to 30 percent pebbles)
Reaction—pH 6.1 to 7.3

BC horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—3, 4, or 6
Texture—coarse sandy loam or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—15 to 45 percent (0 to 10 percent cobbles, 15 to 35 percent pebbles)

Reaction—pH 6.1 to 7.3

Delpoint Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, knolls, and hills
Parent material: Alluvium and residuum derived from semiconsolidated loamy sedimentary beds
Slope range: 2 to 15 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Aridic Haplustepts

Typical Pedon

Delpoint loam, in an area of Delpoint-Abor complex, 4 to 15 percent slopes, in cropland, 1,160 feet east and 550 feet south of the northwest corner of sec. 11, T. 3 N., R. 1 W.

Ap—0 to 8 inches; brown (10YR 5/3) loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots; many fine pores; 1 percent rounded pebbles; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Bw—8 to 16 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; weak coarse prismatic structure parting to moderate medium blocky; slightly hard, friable, slightly sticky and moderately plastic; many fine and very fine roots; many fine and very fine pores; 10 percent rounded pebbles; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

Bk—16 to 24 inches; pale brown (10YR 6/3) clay loam, grayish brown (10YR 5/2) moist; weak coarse prismatic structure; hard, friable, moderately sticky and moderately plastic; common fine and very fine roots; many fine and very fine pores; 10 percent rounded pebbles; disseminated lime, common fine masses of lime, common faint lime coatings on undersides of fragments; strongly effervescent; strongly alkaline (pH 8.8); gradual wavy boundary.

Cr—24 to 60 inches; light gray (10YR 7/1), semiconsolidated loamy sedimentary beds.

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bk horizon: 10 to 20 inches
Depth to Cr horizon: 20 to 40 inches

Ap horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 3, 4, or 5 moist
Chroma—2, 3, or 4
Texture—loam or clay loam
Clay content—20 to 35 percent
Content of rock fragments—0 to 5 percent pebbles
Reaction—pH 6.6 to 8.4

Bw horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—loam, clay loam, or silty clay loam
Clay content—18 to 35 percent clay
Content of rock fragments—0 to 15 percent pebbles
Reaction—pH 7.9 to 9.0

Bk horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—loam, clay loam, or silty clay loam
Clay content—18 to 35 percent clay
Content of rock fragments—0 to 15 percent pebbles
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 9.0

Devilfence Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of hills
Parent material: Residuum derived from hard, brown shale or argillite
Slope range: 2 to 60 percent
Elevation range: 4,400 to 6,500 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Lithic Haplustepts

Typical Pedon

Devilfence very channery loam, 4 to 15 percent slopes, in rangeland, 1,500 feet south and 325 feet west of the northeast corner of sec. 34, T. 4 N., R. 2 W.

A—0 to 3 inches; grayish brown (10YR 5/2) very channery loam, dark grayish brown (10YR 4/2) moist; moderate medium granular structure; slightly hard, very friable, nonsticky and nonplastic; common fine and many very fine roots; 40 percent channers; slightly alkaline (pH 7.6); clear wavy boundary.

Bw—3 to 7 inches; brown (10YR 5/3) very channery loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common fine and very fine roots; common fine and very fine pores; 5 percent flagstones and 40 percent channers; slightly effervescent; slightly alkaline (pH 7.8); clear wavy boundary.

Bk1—7 to 11 inches; pale brown (10YR 6/3) extremely channery loam, brown (10YR 5/3) moist; weak medium and coarse subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; common fine and very fine pores; 10 percent flagstones and 55 percent channers; disseminated lime, common distinct lime coatings on rock fragments; strongly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.

Bk2—11 to 14 inches; pale brown (10YR 6/3) extremely channery loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine roots between channers; 15 percent flagstones and 60 percent channers; common distinct lime casts on rock fragments; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

R—14 inches; brown (10YR 4/3), hard, fractured shale.

Range in Characteristics

Soil temperature: 38 to 42 degrees F

Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)

Depth to Bk horizon: 5 to 10 inches

Depth to bedrock: 10 to 20 inches

A horizon:
- Value—4 or 5 dry; 3 or 4 moist
- Chroma—2 or 3
- Clay content—15 to 27 percent
- Content of rock fragments—35 to 45 percent (0 to 5 percent flagstones, 25 to 40 percent channers)
- Calcium carbonate equivalent—0 to 5 percent
- Reaction—pH 6.6 to 7.8

Bw horizon:
- Value—5 or 6 dry
- Chroma—3 or 4
- Texture—loam or sandy loam
- Clay content—15 to 27 percent
- Content of rock fragments—35 to 60 percent (5 to 10 percent flagstones, 35 to 50 percent channers)
- Calcium carbonate equivalent—0 to 10 percent
- Reaction—pH 6.6 to 7.8

Bk horizon:
- Value—5, 6, or 7 dry
- Chroma—2, 3, or 4
- Texture—loam or sandy loam
- Clay content—15 to 27 percent
- Content of rock fragments—50 to 80 percent (5 to 20 percent flagstones, 45 to 60 percent channers)
- Calcium carbonate equivalent—5 to 15 percent
- Reaction—pH 7.4 to 8.4

Deville Series

Depth class: Shallow (10 to 20 inches)

Drainage class: Somewhat excessively drained

Permeability: Moderately rapid (2.0 to 6.0 inches per hour)

Landform: Escarpments, ridges, and side slopes of hills

Parent material: Residuum derived from hard, brown shale or argillite

Slope range: 4 to 70 percent

Elevation range: 4,400 to 6,500 feet

Annual precipitation: 15 to 19 inches

Annual air temperature: 36 to 40 degrees F

Frost-free period: 80 to 95 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Lithic Haplustepts

Typical Pedon

Deville very channery loam, in an area of Wilde-Deville-Vigilante complex, 8 to 35 percent slopes, in rangeland, 1,750 feet south and 825 feet west of the northeast corner of sec. 13, T. 2 N., R. 4 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) very channery loam, dark brown (10YR 3/3) moist; moderate fine granular structure; slightly hard,

very friable, nonsticky and nonplastic; many fine and very fine roots; 35 percent channers; neutral (pH 6.8); clear wavy boundary.

Bw1—4 to 7 inches; pale brown (10YR 6/3) very channery loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many fine and very fine roots; common fine and very fine pores; 5 percent flagstones and 35 percent channers; slightly alkaline (pH 7.4); clear wavy boundary.

Bw2—7 to 11 inches; brown (10YR 5/3) very channery loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; common fine and very fine pores; 10 percent flagstones and 50 percent channers; slightly alkaline (pH 7.4); gradual wavy boundary.

BC—11 to 17 inches; brown (10YR 5/3) extremely channery sandy loam, brown (10YR 4/3) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; common very fine roots between channers; 15 percent flagstones and 65 percent channers; neutral (pH 7.0); clear wavy boundary.

R—17 inches; brown (10YR 5/3), hard, fractured shale.

Range in Characteristics

Soil temperature: 38 to 42 degrees F

Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)

Depth to bedrock: 10 to 20 inches

Percent of surface covered by stones: 0 to 3 percent

A horizon:
- Value—4 or 5 dry; 3 or 4 moist
- Chroma—2 or 3
- Clay content—15 to 27 percent
- Content of rock fragments—35 to 60 percent (0 to 5 percent flagstones, 35 to 55 percent channers)
- Reaction—pH 6.6 to 7.3

Bw horizon:
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—3 or 4
- Texture—loam or sandy loam
- Clay content—18 to 27 percent
- Content of rock fragments—35 to 60 percent (5 to 10 percent flagstones, 30 to 50 percent channers)
- Reaction—pH 6.6 to 7.8

BC horizon:
- Value—5, 6, or 7 dry; 4 or 5 moist
- Chroma—2, 3, or 4
- Texture—loam or sandy loam
- Clay content—18 to 27 percent
- Content of rock fragments—50 to 80 percent (5 to 15 percent flagstones, 45 to 65 percent channers)
- Reaction—pH 6.6 to 7.3

Dougcliff Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Very poorly drained
Permeability: Moderately rapid (2 to 6 inches per hour)
Landform: Depressional areas on flood plains and flood-plain steps and in drainageways
Parent material: Fibrous materials derived mainly from herbaceous vegetation over alluvium derived from mixed rock sources
Slope range: 0 to 1 percent
Elevation range: 4,400 to 6,500 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 95 days

Taxonomic classification: Euic Typic Haplofibrists

Taxadjunct features: The Dougcliff soils in this survey area are taxadjuncts because they have a mineral soil layer 12 or more inches thick with its upper boundary within 40 inches of the soil surface. These soils are classified as loamy, mixed, euic Terric Haplofibrists.

Typical Pedon

Dougcliff mucky peat, 0 to 1 percent slopes, in rangeland, 450 feet east and 1,900 feet north of the southwest corner of sec. 16, T. 4 N., R. 4 W.

Oi—0 to 11 inches; mucky peat, very dark grayish brown (10YR 3/2) and dark brown (7.5YR 3/2) rubbed and pressed; about 80 percent fiber and raw herbaceous plant material, 70 percent rubbed; massive; nonsticky and nonplastic; neutral (pH 6.6); gradual wavy boundary.

Oe1—11 to 17 inches; mucky peat, very dark gray (10YR 3/1) and black (10YR 2/1) rubbed and pressed; about 90 percent fiber, 80 percent rubbed; massive; nonsticky and nonplastic; 90 percent herbaceous and 10 percent lycopodium mosses; slightly acid (pH 6.2); gradual wavy boundary.

Oe2—17 to 26 inches; mucky peat, very dark gray (10YR 3/1) and black (10YR 2/1) rubbed and pressed; about 85 percent fiber, 80 percent

rubbed; massive; nonsticky and nonplastic; slightly acid (pH 6.2); gradual wavy boundary.
C—26 to 60 inches; very dark gray (5Y 3/1) mucky silt loam, black (10YR 2/1) moist; massive; hard, firm, nonsticky and nonplastic; slightly alkaline (pH 7.6).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Water table: At the surface to 6 inches below the surface

Oi horizon:
Hue—10YR or 7.5YR
Chroma—1 or 2
Fiber content—80 to 90 percent unrubbed; 65 to 75 percent rubbed
Reaction—pH 6.1 to 7.3

Oe horizon:
Hue—10YR or 5Y
Value—2 or 3 moist
Chroma—1 or 2
Fiber content—85 to 95 percent unrubbed; 75 to 85 percent rubbed
Reaction—pH 6.1 to 7.3

C horizon:
Hue—10YR, 2.5Y, or 5Y
Texture—mucky silt loam with stratifications of herbaceous material, sandy loam, or loam
Reaction—pH 6.1 to 7.8

Eagleton Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Poorly drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Flood plains, flood-plain steps, and drainageways
Parent material: Alluvium derived from mixed rock sources
Slope range: 4 to 15 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Cumulic Endoaquolls

Typical Pedon

Eagleton clay loam, in an area of Eagleton, stony-Kokoruda-Cometcrik complex, 2 to 25 percent slopes; in a forested area, 950 feet north and 1,850 feet east of the southwest corner of sec. 4, T. 8 N., R. 4 W.

A1—0 to 6 inches; very dark grayish brown (10YR 3/2) clay loam, black (10YR 2/1) moist; moderate fine and very fine subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many medium, fine, and very fine roots and few coarse roots; many very fine and fine pores; 5 percent rounded pebbles; slightly acid (pH 6.5); clear smooth boundary.
A2—6 to 15 inches; dark gray (10YR 4/1) clay loam; very dark gray (10YR 3/1) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many fine and very fine roots and common medium roots; many fine and very fine pores; 10 percent rounded pebbles; slightly acid (pH 6.5); gradual wavy boundary.
Bw—15 to 36 inches; grayish brown (10YR 5/2) sandy clay loam, very dark gray (10YR 3/1) moist; few fine faint yellowish brown (10YR 5/6) redox concentrations; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots and few medium roots; many fine and very fine pores; 10 percent rounded pebbles; slightly acid (pH 6.5); clear smooth boundary.
Cg1—36 to 50 inches; light gray (5Y 7/1) sandy clay loam, gray (5Y 5/1) moist; common fine faint dark yellowish brown (10YR 4/6) redox concentrations; few faint dark gray (5Y 4/1) redox depletions; massive; slightly hard, friable, slightly sticky and moderately plastic; common fine and very fine roots and few medium roots; many fine and very fine pores and few medium pores; 10 percent rounded pebbles; neutral (pH 6.7); gradual smooth boundary.
Cg2—50 to 60 inches; gray (5Y 6/1) sandy clay loam with thin stratifications of fine sandy loam and clay loam, dark gray (5Y 4/1) moist; many fine distinct yellowish red (5YR 5/6) redox concentrations; few faint dark gray (5Y 4/1) redox depletions; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; many fine and very fine pores; 10 percent rounded pebbles; neutral (pH 7.0).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches

Thickness of the mollic epipedon: 24 to 60 inches
Depth to seasonal high water table: 12 to 24 inches
Percent of surface covered by stones: 0 to 0.1 percent

A horizon:
Value—3, 4, or 5 dry; 2 or 3 moist
Chroma—1 or 2
Clay content—27 to 35 percent
Content of rock fragments—0 to 15 percent pebbles
Reaction—pH 6.1 to 7.3

Bw horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5 dry; 2 or 3 moist
Chroma—1 or 2
Texture—loam, clay loam, or sandy clay loam
Clay content—18 to 30 percent
Content of rock fragments—0 to 15 percent pebbles
Reaction—pH 6.1 to 7.8

Cg horizon:
Hue—5Y or N
Value—5, 6, or 7 dry; 4 or 5 moist
Texture—sandy clay loam with stratifications of sandy loam, silty clay, loam, and clay loam
Clay content—10 to 27 percent
Content of rock fragments—0 to 15 percent pebbles
Reaction—pH 6.6 to 7.8

Ellena Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Ridges and side slopes of mountains
Parent material: Local colluvium, slope alluvium, and residuum derived from granite
Slope range: 15 to 60 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Ustic Eutrocryepts

Typical Pedon

Ellena very cobbly sandy loam, in an area of Kurrie, very bouldery-Ellena, very bouldery-Rock outcrop complex, 25 to 60 percent slopes; in a forested area, 350 feet north and 1,700 feet west of the southeast corner of sec. 18, T. 9 N., R. 3 W.

Oi—2 inches to 0; forest litter of partially decomposed needles, leaves, and twigs.
A—0 to 5 inches; grayish brown (10YR 5/2) very cobbly sandy loam, dark brown (10YR 3/3) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine, common fine, and few medium roots; many very fine and fine pores; 30 percent cobbles and 10 percent granite pebbles; neutral (pH 6.6); clear smooth boundary.
E—5 to 20 inches; light brownish gray (2.5Y 6/2) very cobbly coarse sandy loam, grayish brown (2.5Y 5/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine roots and few fine and medium roots; many very fine and fine pores; 5 percent stones, 25 percent cobbles, 10 percent granite pebbles; slightly acid (pH 6.4); clear wavy boundary.
E/Bw—20 to 33 inches; 85 percent light brownish gray (2.5Y 6/2) very cobbly coarse sandy loam, grayish brown (2.5Y 5/2) moist (E part); 15 percent light olive brown (2.5Y 5/4) very cobbly sandy clay loam, olive brown (2.5Y 4/4) moist (Bw part); moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; many very fine roots and few fine and medium roots; many very fine and few fine pores; 5 percent stones, 35 percent cobbles, 10 percent granite pebbles; slightly acid (pH 6.3); clear wavy boundary.
Cr—33 to 36 inches; light brownish gray (2.5Y 6/2), decomposed granite bedrock (grus) that crushes to very gravelly coarse sand.
R—36 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Depth to Cr horizon: 20 to 38 inches
Depth to R layer: 23 to 40 inches
Percent of surface covered by stones/boulders: 0.1 to 3.0 percent

A horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2, 3, or 4
Texture—coarse sandy loam or sandy loam
Clay content—10 to 20 percent
Content of rock fragments—10 to 60 percent (0 to 40 percent cobbles and stones, 10 to 30 percent pebbles)
Reaction—pH 6.1 to 7.3

E horizon:
Hue—10YR or 2.5Y
Value—6, 7, or 8 dry; 4, 5, or 6 moist
Chroma—1, 2, or 3
Texture—coarse sandy loam, sandy loam, or loam
Clay content—10 to 18 percent
Content of rock fragments—20 to 60 percent (0 to 45 percent cobbles and stones, 5 to 25 percent pebbles)
Reaction—pH 6.1 to 7.3

E/Bw horizon:
Hue—10YR or 2.5Y
Value—6, 7, or 8 dry, 4, 5, or 6 moist (E part); 4, 5, or 6 dry, 3, 4, or 5 moist (Bw part)
Chroma—1, 2, 3, or 4 (E part); 2, 3, or 4 (Bw part)
Texture (mixed)—coarse sandy loam or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—35 to 60 percent (0 to 40 percent cobbles and stones, 10 to 30 percent pebbles)
Reaction—pH 6.1 to 7.3

Elmark Series

Depth class: Moderately deep (20 to 40 inches) to weathered granite bedrock and deep (40 to 60 inches) to hard granite bedrock
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of hills and mountains
Parent material: Local colluvium, alluvium, or residuum derived from granite
Slope range: 8 to 60 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 70 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Typic Haplustalfs

Typical Pedon

Elmark sandy clay loam, in an area of Elmark, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes, dry; in a forested area, 1,250 feet north and 1,000 feet east of the southwest corner of sec. 20, T. 9 N., R. 2 W.

Oi—2 inches to 0; forest litter of partially decomposed needles, twigs, and leaves.
A—0 to 3 inches; dark grayish brown (10YR 4/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium roots; many very fine and fine pores; 5 percent granite pebbles; neutral (pH 7.0); clear smooth boundary.
E—3 to 7 inches; light brownish gray (2.5Y 6/2) sandy clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots and few fine and medium roots; many very fine and few fine pores; 5 percent granite pebbles; slightly acid (pH 6.2); clear wavy boundary.
Bt—7 to 19 inches; light yellowish brown (2.5Y 6/4) gravelly sandy clay loam, olive brown (2.5Y 4/4) moist; weak medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; many very fine roots and few fine and medium roots; many very fine and few fine pores; many faint clay films bridging sand grains and on faces of peds; 20 percent granite pebbles; slightly acid (pH 6.2); gradual wavy boundary.
BC—19 to 30 inches; light olive brown (2.5Y 5/4) gravelly sandy loam, dark grayish brown (2.5Y 4/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and few fine roots; many very fine pores; 30 percent granite pebbles; slightly acid (pH 6.1); clear irregular boundary.
Cr—30 to 57 inches; olive (5Y 5/3), decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand or gravelly coarse sand.
R—57 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 5 to 17 inches
Depth to Cr horizon: 20 to 40 inches
Depth to R layer: 40 to 60 inches
Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
Hue—10YR or 2.5Y
Value—3, 4, or 5 dry; 2, 3, or 4 moist
Chroma—1, 2, or 3
Texture—coarse sandy loam, sandy loam, sandy clay loam, or loam

Clay content—8 to 25 percent
Content of rock fragments—0 to 50 percent (0 to 20 percent cobbles, 5 to 30 percent pebbles)
Reaction—pH 6.1 to 7.3

E horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Texture—coarse sandy loam, sandy loam, or sandy clay loam
Clay content—10 to 25 percent
Content of rock fragments—5 to 25 percent pebbles
Reaction—pH 5.6 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—sandy clay loam or clay loam
Clay content—20 to 30 percent
Content of rock fragments—5 to 25 percent pebbles
Reaction—pH 6.1 to 7.3

BC horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—coarse sandy loam or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—15 to 35 percent pebbles
Reaction—pH 6.1 to 7.3

Elve Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Alluvial fans, mountain valleys, and sides of mountains
Parent material: Colluvium and alluvium derived mainly from fine grained igneous rocks
Slope range: 2 to 70 percent slopes
Elevation range: 5,500 to 8,000 feet
Annual precipitation: 15 to 30 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 30 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Ustic Eutrocryepts

Typical Pedon

Elve very cobbly loam, in an area of Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes, dry; in a forested area, 50 feet west and 1,500 feet south of the northeast corner of sec. 11, T. 4 N., R. 4 W.

Oi—1 inch to 0; forest litter of partially decomposed needles, twigs, and cones.
A1—0 to 2 inches; dark grayish brown (10YR 4/2) very cobbly loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many medium and coarse roots; many fine and very fine pores; 20 percent angular cobbles and 20 percent angular pebbles; moderately acid (pH 5.8); clear wavy boundary.
A2—2 to 5 inches; brown (10YR 5/3) very cobbly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many medium and coarse roots; many fine and very fine pores; 25 percent angular cobbles and 20 percent angular pebbles; moderately acid (pH 5.8); clear wavy boundary.
E—5 to 11 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 5/3) moist; weak medium and coarse subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine, medium, and coarse roots; many fine and very fine pores; 15 percent angular cobbles and 45 percent angular pebbles; slightly acid (pH 6.2); gradual wavy boundary.
Bw—11 to 18 inches; light brownish gray (10YR 6/2) very gravelly loam, brown (10YR 5/3) moist; moderate medium prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; common fine, medium, and coarse roots; many fine and very fine pores; 15 percent angular cobbles and 40 percent angular pebbles; slightly acid (pH 6.3); gradual wavy boundary.
BC—18 to 32 inches; pale brown (10YR 6/3) very gravelly coarse sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; common fine, medium, and coarse roots; many fine and very fine pores; 20 percent angular cobbles and 45 percent angular pebbles; slightly acid (pH 6.3); gradual wavy boundary.
C—32 to 60 inches; light yellowish brown (10YR 6/4) extremely gravelly coarse sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few fine and

very fine roots; common fine pores; 25 percent angular cobbles and 40 percent angular pebbles; slightly acid (pH 6.3).

Range in Characteristics

Soil temperature: 36 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Percent of surface covered by stones/boulders: 0 to 20 percent

A horizon:
Value—4, 5, or 6 dry; 2, 3, or 4 moist
Chroma—2, 3, or 4
Texture—sandy loam or loam
Clay content—10 to 27 percent
Content of rock fragments—5 to 60 percent (0 to 30 percent cobbles and stones, 5 to 30 percent pebbles)
Reaction—pH 5.1 to 6.5

E horizon:
Value—6 or 7 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—loam or sandy loam
Clay content—10 to 20 percent
Content of rock fragments—35 to 85 percent (0 to 25 percent stones, 10 to 40 percent cobbles, 20 to 45 percent pebbles)
Reaction—pH 5.1 to 6.5

Bw horizon:
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—loam, coarse sandy loam, or sandy loam
Clay content—10 to 20 percent
Content of rock fragments—60 to 85 percent (15 to 40 percent cobbles and stones, 25 to 45 percent pebbles)
Reaction—pH 5.1 to 6.5

BC and C horizons:
Value—6 or 7 dry; 4 or 5 moist
Chroma—3, 4, or 6
Texture—coarse sandy loam, sandy loam, or loam
Clay content—10 to 20 percent
Content of rock fragments—60 to 85 percent (20 to 40 percent cobbles and stones, 35 to 45 percent pebbles)
Reaction—pH 5.1 to 6.5

Elvick Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat poorly drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans; drainageways in mountains
Parent material: Alluvium derived from granite and hard, fine grained igneous rock
Slope range: 1 to 25 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Oxyaquic Eutrocryepts

Typical Pedon

Elvick very cobbly loam, in an area of Elvick-Lowder complex, 8 to 25 percent slopes, very bouldery; in a forested area, 950 feet south and 2,500 feet east of the northwest corner of sec. 6, T. 3 N., R. 3 W.

Oi—2 inches to 0; forest litter of partially decomposed needles, leaves, and twigs.
A—0 to 1 inch; dark grayish brown (10YR 4/2) very cobbly loam, very dark brown (10YR 2/2) moist; weak medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine and few medium and coarse roots; many very fine and fine pores; 20 percent cobbles and 15 percent pebbles; slightly acid (pH 6.4); clear wavy boundary.
E1—1 to 7 inches; light brownish gray (10YR 6/2) very cobbly loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine and few medium and coarse roots; many very fine and fine pores; 25 percent cobbles and 20 percent pebbles; slightly acid (pH 6.2); gradual wavy boundary.
E2—7 to 18 inches; light brownish gray (10YR 6/2) very cobbly loam, grayish brown (10YR 5/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and few medium and coarse roots; many very fine and fine pores; 30 percent cobbles and 20 percent pebbles; slightly acid (pH 6.2); gradual wavy boundary.
E/Bw—18 to 26 inches; 80 percent light brownish gray (10YR 6/2) very cobbly coarse sandy loam, brown (10YR 5/3) moist (E part); 20 percent pale brown (10YR 6/3) very cobbly coarse sandy loam, brown (10YR 4/3) moist (Bw part); moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common

very fine, fine, and medium roots; many very fine and fine pores; 30 percent cobbles and 25 percent pebbles; slightly acid (pH 6.3); gradual wavy boundary.

Bw—26 to 38 inches; pale brown (10YR 6/3) very cobbly coarse sandy loam, brown (10YR 4/3) moist; common fine distinct strong brown (7.5YR 5/6) redox concentrations; moderate medium subangular blocky structure; hard, firm, slightly sticky and nonplastic; common very fine, fine, and medium roots; many very fine and fine pores; 30 percent cobbles and 25 percent pebbles; slightly acid (pH 6.4); gradual wavy boundary.

BC—38 to 60 inches; light yellowish brown (10YR 6/4) extremely cobbly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; common fine distinct strong brown (7.5YR 5/6) redox concentrations; moderate fine and medium subangular blocky structure; hard, firm, slightly sticky and nonplastic; few very fine, fine, and medium roots; common very fine and fine pores; 40 percent cobbles and 25 percent pebbles; slightly acid (pH 6.4).

Range in Characteristics

Soil temperature: 36 to 42 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Depth to the water table: 24 to 42 inches from May through July
Percent of surface covered by stones/boulders: 0 to 15 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—4 or 5 dry
- Chroma—2 or 3
- Clay content—18 to 27 percent
- Content of rock fragments—0 to 65 percent (0 to 20 percent stones and boulders, 20 to 30 percent cobbles, 10 to 25 percent pebbles)
- Reaction—pH 6.1 to 6.5

E horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2, 3, or 4
- Texture—loam or coarse sandy loam
- Clay content—15 to 25 percent
- Content of rock fragments—0 to 65 percent (0 to 20 percent stones and boulders, 20 to 30 percent cobbles, 15 to 25 percent pebbles)
- Reaction—pH 6.1 to 6.5

E/Bw horizon:
- Value—6 or 7 dry, 5 or 6 moist (E part); 5 or 6 dry, 4 or 5 moist (Bw part)
- Chroma—2 or 3
- Texture—coarse sandy loam or sandy loam
- Clay content—10 to 18 percent
- Content of rock fragments—35 to 75 percent (0 to 20 percent stones, 20 to 30 percent cobbles, 10 to 25 percent pebbles)
- Reaction—pH 6.1 to 6.5

Bw horizon:
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2 or 3
- Texture—coarse sandy loam or sandy loam
- Clay content—10 to 18 percent
- Content of rock fragments—35 to 75 percent (0 to 20 percent stones, 20 to 30 percent cobbles, 10 to 25 percent pebbles)
- Reaction—pH 6.1 to 6.5

BC horizon:
- Value—5 or 6 dry
- Chroma—3, 4, or 5
- Texture—coarse sandy loam or sandy loam
- Clay content—8 to 15 percent
- Content of rock fragments—35 to 75 percent (0 to 25 percent stones, 20 to 40 percent cobbles, 15 to 30 percent pebbles)
- Reaction—pH 6.1 to 6.5

Ethridge Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Slow (0.06 to 0.2 inch per hour)
Landform: Alluvial fans, stream terraces, escarpments, and side slopes of hills
Parent material: Alluvium derived mainly from semiconsolidated shale
Slope range: 0 to 70 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine, smectitic, frigid Torrertic Argiustolls

Typical Pedon

Ethridge clay loam, 2 to 8 percent slopes, in rangeland, 1,450 feet east and 2,300 feet south of the northwest corner of sec. 27, T. 2 N., R. 1 W.

Ap—0 to 5 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, friable, moderately sticky and moderately plastic; many very fine and fine roots; 5 percent rounded pebbles; slightly alkaline (pH 7.8); abrupt smooth boundary.

Bt—5 to 13 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to strong fine and very fine subangular blocky; hard, firm, moderately sticky and very plastic; many very fine and fine roots; many fine and very fine pores; common faint very dark grayish brown (10YR 3/2) clay films on faces of peds; 5 percent rounded pebbles; slightly alkaline (pH 7.8); clear wavy boundary.

Bk—13 to 26 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate coarse prismatic structure; hard, friable, moderately sticky and moderately plastic; many very fine and fine roots; many fine and very fine pores; disseminated lime, common fine threads and masses of lime; violently effervescent; moderately alkaline (pH 8.4); gradual irregular boundary.

Bky—26 to 60 inches; pale brown (10YR 6/3) loam with thin layers of silt loam and silty clay, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine pores; disseminated lime, common fine threads and masses of lime; few fine nests and seams of gypsum; strongly effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 14 inches
Depth to Bk horizon: 10 to 20 inches

Ap horizon:
- Value—2 or 3 moist
- Chroma—2 or 3
- Texture—clay loam or loam
- Clay content—20 to 35 percent
- Content of rock fragments—0 to 5 percent pebbles
- Reaction—pH 6.6 to 8.4; pH 7.4 to 8.4 in the saline phase
- Electrical conductivity—4 to 16 mmhos/cm (saline phase)
- Sodium adsorption ratio—0 to 4 (saline phase)

Bt horizon:
- Hue—10YR or 2.5Y
- Value—4 or 5 dry; 3 or 4 moist
- Chroma—2, 3, or 4
- Texture—clay, silty clay, clay loam, or silty clay loam
- Clay content—35 to 45 percent
- Content of rock fragments—0 to 5 percent pebbles
- Reaction—pH 6.6 to 8.4; pH 7.4 to 9.0 in the saline phase

Bk and Bky horizons:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—clay, silty clay loam, loam, clay loam, or silty clay
- Clay content—20 to 45 percent
- Content of rock fragments—0 to 5 percent pebbles
- Calcium carbonate equivalent—5 to 15 percent
- Electrical conductivity—0 to 4 mmhos/cm; 8 to 16 mmhos/cm in the saline phase
- Content of gypsum—0 to 3 percent; 1 to 3 percent in the saline phase
- Reaction—pH 7.4 to 9.0; pH 7.4 to 9.0 in the saline phase

Fairway Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat poorly drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Flood plains, flood-plain steps, and stream terraces
Parent material: Alluvium derived from mixed rock sources
Slope range: 0 to 2 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Fluvaquentic Haplustolls

Typical Pedon

Fairway clay loam, 0 to 2 percent slopes, in cropland, 1,575 feet north and 2,550 feet west of the southeast corner of sec. 35, T. 2 N., R. 5 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10Y 3/2) moist;

moderate fine granular structure; slightly hard, friable, moderately sticky and slightly plastic; common very fine roots; disseminated lime; slightly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

A—7 to 13 inches; dark grayish brown (10YR 4/2) silty clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many very fine and fine roots; common very fine pores; disseminated lime; slightly effervescent; slightly alkaline (pH 7.8); clear wavy boundary.

Bk—13 to 25 inches; brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; few fine distinct dark reddish brown (5YR 3/4) redox concentrations; weak medium prismatic structure parting to weak coarse subangular blocky; hard, friable, moderately sticky and slightly plastic; many very fine and fine roots; common very fine pores; disseminated lime, few fine seams and masses of lime; strongly effervescent; moderately alkaline (pH 7.9); clear smooth boundary.

Bg—25 to 40 inches; pale brown (10YR 6/3) silt loam, brown (10YR 4/3) moist; common or many fine distinct dark reddish brown (5YR 3/4) redox concentrations; massive; hard, friable, moderately sticky and moderately plastic; disseminated lime; slightly effervescent; slightly alkaline (pH 7.6); clear smooth boundary.

Cg—40 to 60 inches; dark grayish brown (10YR 4/2) silt loam with strata of fine sand, silty clay loam, and coarse sandy loam, very dark grayish brown (10YR 3/2) moist; many fine and medium prominent yellowish red (5YR 4/6) (moist) redox concentrations; massive; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; neutral (pH 7.3).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Thickness of the mollic epipedon: 10 to 15 inches
Depth to seasonal high water table: 24 to 42 inches

A horizon:
- Value—4 or 5 dry; 2 or 3 moist
- Chroma—1 or 2
- Texture—loam, silt loam, or clay loam
- Clay content—15 to 35 percent
- Calcium carbonate equivalent—2 to 5 percent
- Reaction—pH 6.6 to 8.4

Bk horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 3 or 4 moist
- Chroma—2 or 3
- Texture—loam, silt loam, or clay loam
- Clay content—18 to 35 percent
- Content of rock fragments—0 to 10 percent pebbles
- Calcium carbonate equivalent—5 to 15 percent
- Reaction—pH 7.4 to 8.4

Bg horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 3 or 4 moist
- Chroma—1, 2, or 3
- Texture—loam, silt loam, or silty clay loam; some thin strata of sandy loam, loamy sand, and clay loam
- Clay content—18 to 30 percent
- Content of rock fragments—0 to 10 percent pebbles
- Calcium carbonate equivalent—2 to 10 percent
- Reaction—pH 7.4 to 8.4

Cg horizon:
- Hue—10YR, 2.5Y, or 5Y
- Value—4, 5, or 6 dry; 3 or 4 moist
- Chroma—1 or 2
- Texture—silt loam with strata of fine sand, silty clay loam, and coarse sandy loam
- Clay content—10 to 22 percent
- Content of rock fragments—0 to 20 percent pebbles
- Calcium carbonate equivalent—0 to 10 percent
- Reaction—pH 6.6 to 7.8

Faith Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Moderately well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Flood-plain steps, drainageways, alluvial fans, and stream terraces
Parent material: Alluvium derived mainly from mixed rock sources
Slope range: 0 to 8 percent
Elevation range: 3,800 to 5,500 feet
Annual precipitation: 10 to 17 inches
Annual air temperature: 36 to 44 degrees F
Frost-free period: 80 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Torrifluventic Haplustolls

Typical Pedon

Faith loam, 0 to 2 percent slopes, in pasture, 1,375

feet south and 75 feet west of the northeast corner of sec. 3, T. 1 N., R. 4 W.

Ap1—0 to 4 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; slightly alkaline (pH 7.4); clear smooth boundary.

Ap2—4 to 8 inches; grayish brown (10YR 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; disseminated lime; slightly effervescent; slightly alkaline (pH 7.8); clear wavy boundary.

Bw—8 to 14 inches; grayish brown (10YR 5/2) silty clay loam, dark grayish brown (10YR 4/2) moist; strong medium prismatic structure parting to moderate medium subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; disseminated lime; slightly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

Bk—14 to 31 inches; light brownish gray (10YR 6/2) silty clay loam, grayish brown (10YR 5/2) moist; strong coarse prismatic structure parting to strong medium subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; disseminated lime, few very fine threads of lime; strongly effervescent; moderately alkaline (pH 8.3); clear smooth boundary.

2C—31 to 47 inches; light brownish gray (2.5Y 6/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; moderately alkaline (pH 8.2); clear smooth boundary.

2Cg1—47 to 56 inches; grayish brown (2.5Y 5/2) silt loam, dark grayish brown (2.5Y 4/2) moist; common distinct yellowish red (5YR 5/6) redox concentrations; massive; slightly hard, very friable, slightly sticky and nonplastic; few very fine roots; moderately alkaline (pH 8.2); clear smooth boundary.

2Cg2—56 to 60 inches; light olive gray (5Y 6/2) loam, olive gray (5Y 4/2) moist; common faint very dark gray (5Y 3/1) redox depletions; common faint yellowish red (5YR 5/6) redox concentrations; massive; slightly hard, very friable, slightly sticky and nonplastic; moderately alkaline (pH 8.2).

Range in Characteristics

Soil temperature: 38 to 46 degrees F

Moisture control section: Between the depths of 4 and 12 inches

Thickness of the mollic epipedon: 7 to 15 inches

Depth to the water table: 42 to 60 inches for extended periods during spring and early summer

Ap horizon:
- Hue—10YR or 2.5Y
- Chroma—2 or 3
- Texture—loam or sandy loam; layers containing varying amounts of heavy metals from mining leach and settling ponds in the impacted phase
- Clay content—15 to 27 percent
- Content of rock fragments—0 to 10 percent pebbles
- Calcium carbonate equivalent—0 to 5 percent
- Reaction—pH 6.6 to 7.8; pH 5.1 to 6.5 in the impacted phase

Bw horizon:
- Hue—10YR or 2.5Y
- Value—4, 5, or 6 dry; 3, 4, or 5 moist
- Chroma—2 or 3
- Texture—loam, silt loam, or silty clay loam with thin strata of finer and coarser materials
- Clay content—18 to 30 percent
- Content of rock fragments—0 to 10 percent pebbles
- Calcium carbonate equivalent—0 to 10 percent
- Reaction—pH 7.4 to 8.4

Bk horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—loam, silt loam, silty clay loam, or clay loam with thin strata of finer and coarser materials
- Clay content—18 to 30 percent
- Content of rock fragments—0 to 10 percent pebbles
- Electrical conductivity—0 to 2 mmhos/cm
- Calcium carbonate equivalent—5 to 15 percent
- Reaction—pH 7.4 to 8.4

2C horizon:
- Hue—10YR, 2.5Y, or 5Y
- Value—4, 5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—1, 2, or 3
- Texture—fine sandy loam, loam, silt loam, or very fine sandy loam
- Clay content—12 to 27 percent with 15 percent or more fine sand or coarser

Content of rock fragments—0 to 15 percent pebbles
Electrical conductivity—0 to 4 mmhos/cm
Calcium carbonate equivalent—1 to 15 percent
Reaction—pH 7.4 to 8.4

Farnuf Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Stream terraces, alluvial fans, and side slopes of hills
Parent material: Alluvium derived mainly from mixed rock sources
Slope range: 2 to 35 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Farnuf sandy loam, 2 to 8 percent slopes, in rangeland, 650 feet west and 2,450 feet north of the southeast corner of sec. 5, T. 5 N., R. 4 W.

A—0 to 7 inches; grayish brown (10YR 5/2) sandy loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and medium roots; 5 percent rounded pebbles; neutral (pH 6.7); clear smooth boundary.
Bt—7 to 14 inches; dark yellowish brown (10YR 4/4) gravelly sandy clay loam, brown (10YR 4/3) moist; strong medium prismatic structure parting to strong fine and medium subangular blocky; hard, friable, moderately sticky and slightly plastic; many very fine and fine roots and common medium roots; many fine and very fine pores; continuous faint dark grayish brown (10YR 4/2) clay films on faces of peds; 20 percent rounded pebbles; slightly alkaline (pH 7.4); clear wavy boundary.
Bk1—14 to 23 inches; light yellowish brown (10YR 6/4) gravelly loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many fine and very fine roots; many fine and very fine pores; 30 percent rounded pebbles; disseminated lime, few fine masses and threads of lime; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
Bk2—23 to 32 inches; very pale brown (10YR 7/3) gravelly loam, light yellowish brown (10YR 6/4) moist; weak coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and very fine pores; 30 percent pebbles; disseminated lime, common fine threads and masses of lime, continuous faint coatings of lime on pebbles; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.
BC—32 to 60 inches; very pale brown (10YR 7/4) gravelly sandy clay loam consisting of stratified sandy clay loam, loam, and fine sandy loam, yellowish brown (10YR 5/4) moist; massive; hard, very friable, moderately sticky and slightly plastic; few fine and very fine roots; common fine and very fine pores; 30 percent pebbles; disseminated lime; strongly effervescent; strongly alkaline (pH 8.5).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bt horizon: 6 to 11 inches
Depth to Bk horizon: 10 to 25 inches
Percent of surface covered by stones: 0 to 0.1 percent

A horizon:
Hue—2.5Y or 10YR
Value—3, 4, or 5 dry; 2 or 3 moist
Chroma—2 or 3
Texture—loam, sandy clay loam, or sandy loam
Clay content—15 to 27 percent
Content of rock fragments—0 to 35 percent (0 to 20 percent cobbles and stones, 0 to 15 percent pebbles)
Reaction—pH 6.6 to 7.3

Bt horizon:
Hue—2.5Y or 10YR
Value—3, 4, 5, or 6 dry; 2, 3, or 4 moist
Chroma—2, 3, or 4
Texture—loam, clay loam, or sandy clay loam
Clay content—20 to 35 percent
Content of rock fragments—5 to 35 percent pebbles
Reaction—pH 6.6 to 7.8

Bk horizon:
Hue—2.5Y or 10YR
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4

Texture—fine sandy loam, loam, silt loam, or sandy clay loam
Clay content—12 to 27 percent
Content of rock fragments—10 to 35 percent pebbles
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.4 to 8.4

BC horizon:
Hue—2.5Y or 10YR
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—loam or sandy clay loam consisting of strata of fine sandy loam, clay loam, sandy clay loam, loam, or silt loam
Clay content—12 to 27 percent
Content of rock fragments—10 to 35 percent (0 to 5 percent cobbles, 10 to 30 percent pebbles)
Calcium carbonate equivalent—3 to 10 percent
Reaction—pH 7.4 to 9.0

Ferball Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Alluvial fans and side slopes of hills
Parent material: Alluvium derived from red shale bedrock
Slope range: 2 to 8 percent
Elevation range: 4,000 to 6,000 feet
Annual precipitation: 10 to 16 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 85 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Aridic Haplustalfs

Typical Pedon

Ferball clay loam, 2 to 8 percent slopes, in rangeland, 200 feet south and 2,900 feet west of the northeast corner of sec. 27, T. 2 N., R. 3 W.

A—0 to 5 inches; yellowish red (5YR 4/6) clay loam, reddish brown (5YR 4/4) moist; strong fine blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many very fine and few fine roots; many very fine and fine pores; disseminated lime; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.
Btk—5 to 12 inches; red (2.5YR 5/6) clay loam, red (2.5YR 4/6) moist; strong medium prismatic structure; hard, firm, moderately sticky and slightly plastic; many very fine and few fine roots; many very fine pores; many faint clay films on faces of peds; disseminated lime, few fine masses of lime; strongly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.
Bk1—12 to 45 inches; red (2.5YR 5/6) clay loam, red (2.5YR 4/6) moist; moderate fine subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; common very fine and few fine roots; many very fine pores; disseminated lime, few fine masses of lime; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.
Bk2—45 to 60 inches; red (2.5YR 5/6) silty clay loam, red (2.5YR 4/6) moist; weak fine subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; few very fine roots; common very fine tubular pores; disseminated lime, few fine masses of lime; violently effervescent; moderately alkaline (pH 8.3).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 3 to 5 inches
Depth to Bk horizon: 10 to 15 inches

A horizon:
Hue—5YR or 7.5YR
Value—4 or 5 dry; 3 or 4 moist
Chroma—3, 4, or 6
Clay content—27 to 30 percent
Content of rock fragments—0 to 15 percent pebbles
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 7.9 to 8.4

Btk horizon:
Hue—2.5YR or 5YR
Value—5 or 6 dry; 4 or 5 moist
Chroma—4, 6, or 8
Texture—loam, clay loam, or silty clay loam
Clay content—25 to 35 percent
Content of rock fragments—0 to 15 percent pebbles
Calcium carbonate equivalent—5 to 10 percent
Reaction—pH 7.9 to 8.4

Bk horizon:
Hue—2.5YR or 5YR
Value—5 or 6 dry; 4 or 5 moist
Chroma—4, 6, or 8
Texture—loam, clay loam, or silty clay loam
Clay content—20 to 30 percent
Content of rock fragments—0 to 15 percent pebbles

Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 8.4

Firada Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Upper side slopes and ridges of mountains
Parent material: Local colluvium, alluvium, and residuum derived from limestone
Slope range: 4 to 45 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Typic Eutrocryepts

Taxadjunct features: The Firada soils in this survey area are taxadjuncts because they have a higher content of lime than is defined as the range for the series. These soils are classified as loamy-skeletal, carbonatic Typic Eutrocryepts.

Typical Pedon

Firada very gravelly loam, in an area of Whitore, stony-Helmville, bouldery-Firada, very stony, complex, 15 to 45 percent slopes; in a forested area, 2,550 feet east and 1,650 feet south of the northwest corner of sec. 11, T. 5 N., R. 2 E.

Oi—1/2 inch to 0; forest litter of partially decomposed needles, leaves, and twigs.
A—0 to 4 inches; dark grayish brown (10YR 4/2) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots and common medium roots; 5 percent angular cobbles and 35 percent angular pebbles; disseminated lime, common faint lime coatings on undersides of fragments; slightly effervescent; slightly alkaline (pH 7.6); clear wavy boundary.
Bw—4 to 9 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 5/3) moist; moderate medium prismatic structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots and common medium roots; many very fine and fine pores; 25 percent angular cobbles and 20 percent angular pebbles; disseminated lime, common faint lime coatings on undersides of fragments; strongly effervescent; slightly alkaline (pH 7.8); clear wavy boundary.
Bk1—9 to 17 inches; very pale brown (10YR 7/3) very cobbly loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and common medium roots; many very fine and fine pores; 30 percent angular cobbles and 20 percent angular pebbles; disseminated lime, common distinct lime casts on sides and bottoms of fragments; violently effervescent; moderately alkaline (pH 8.3); gradual wavy boundary.
Bk2—17 to 36 inches; light gray (10YR 7/2) very cobbly loam, light brownish gray (10YR 6/2) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; common very fine, fine, and medium roots; many very fine and fine pores; 30 percent angular cobbles and 30 percent angular pebbles; disseminated lime, common distinct lime casts around fragments; violently effervescent; moderately alkaline (pH 8.3).
R—36 inches; hard, fractured, light gray (10YR 7/2) limestone.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bk horizon: 7 to 25 inches
Depth to bedrock: 20 to 40 inches
Percent of surface covered by stones: 0.01 to 3.0 percent

A horizon:
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2 or 3
Clay content—15 to 25 percent
Content of rock fragments—15 to 50 percent (0 to 15 percent angular cobbles, 15 to 35 percent angular pebbles)
Calcium carbonate equivalent—5 to 10 percent
Reaction—pH 7.4 to 8.4

Bw horizon:
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Clay content—15 to 25 percent
Content of rock fragments—30 to 60 percent (15 to 30 percent angular cobbles, 15 to 30 percent angular pebbles)
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.4 to 8.4

Bk horizon:
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2 or 3
Clay content—15 to 25 percent

Content of rock fragments—35 to 60 percent (20 to 30 percent angular cobbles, 20 to 30 percent angular pebbles)
Calcium carbonate equivalent—40 to 60 percent
Reaction—pH 7.9 to 8.4

Floweree Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Stream terraces, alluvial fans, and knolls
Parent material: Alluvium derived mainly from semiconsolidated sedimentary beds; eolian deposits
Slope range: 0 to 15 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-silty, mixed, superactive, frigid Aridic Haplustolls

Typical Pedon

Floweree silt loam, 2 to 8 percent slopes, in cropland, 2,100 feet north and 575 feet west of the southeast corner of sec. 34, T. 2 N., R. 1 W.

Ap—0 to 7 inches; grayish brown (2.5Y 5/2) silt loam, very dark grayish brown (10YR 3/2) moist; moderate fine and very fine granular structure; hard, friable, slightly sticky and slightly plastic; many very fine roots; neutral (pH 7.0); abrupt smooth boundary.
Bw1—7 to 11 inches; grayish brown (10YR 5/2) silt loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many very fine roots; many very fine pores; neutral (pH 7.0); clear smooth boundary.
Bw2—11 to 16 inches; brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; moderate medium prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine pores; slightly effervescent; slightly alkaline (pH 7.4); clear wavy boundary.
Bk1—16 to 34 inches; light gray (10YR 7/2) silt loam, pale brown (10YR 6/3) moist; moderate medium and coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine pores; disseminated lime, few fine threads and masses of lime; violently effervescent; moderately alkaline (pH 8.2); gradual smooth boundary.
Bk2—34 to 42 inches; light gray (10YR 7/2) loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine pores; disseminated lime, common fine threads and masses of lime; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.
Bk3—42 to 60 inches; very pale brown (10YR 7/3) silt loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine pores; disseminated lime, few fine threads and masses of lime; strongly effervescent; moderately alkaline (pH 8.0).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 13 inches
Depth to Bk horizon: 11 to 20 inches

Ap horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 2 or 3 moist
Chroma—2 or 3
Clay content—15 to 25 percent
Reaction—pH 6.6 to 7.8

Bw horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2 or 3
Clay content—12 to 22 percent
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 6.6 to 7.8

Bk horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Clay content—12 to 25 percent
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 8.4

Foolhen Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Very poorly drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)

Landform: Flood plains and flood-plain steps in mountains
Parent material: Alluvium derived from mixed rock sources
Slope range: 0 to 4 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Fine-loamy, mixed, superactive Typic Cryaquolls

Typical Pedon

Foolhen mucky loam, in an area of Foolhen, stony-Tibkey, bouldery, complex, 0 to 8 percent slopes, in a wet meadow, 1,100 feet west and 2,225 feet south of the northeast corner of sec. 6, T. 3 N., R. 3 W.

Oe—1 inch to 0; mat of partially decomposed organic material and roots.
A1—0 to 4 inches; black (5Y 2.5/2) mucky loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots and common medium roots; 5 percent rounded cobbles and 10 percent rounded pebbles; neutral (pH 6.8); clear wavy boundary.
A2—4 to 13 inches; black (5Y 2.5/2) mucky silt loam, black (10YR 2/1) moist; few distinct reddish brown (5YR 5/4) redox concentrations; moderate medium prismatic structure parting to moderate fine subangular blocky; hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine pores; 5 percent rounded cobbles and 20 percent rounded pebbles; neutral (pH 6.8); gradual wavy boundary.
Bw—13 to 21 inches; pale brown (10YR 6/3) gravelly sandy clay loam, dark brown (10YR 3/3) moist; many distinct yellowish red (5YR 5/6) redox concentrations; common faint very dark gray (5Y 3/1) redox depletions; moderate medium subangular blocky structure; hard, friable, moderately sticky and slightly plastic; many very fine and fine roots; few very fine pores; 5 percent rounded cobbles and 20 percent rounded pebbles; neutral (pH 7.0); gradual wavy boundary.
Cg1—21 to 32 inches; brown (10YR 5/3) gravelly sandy clay loam, brown (10YR 4/3) moist; many distinct yellowish red (5YR 5/6) redox concentrations; common faint very dark gray (5Y 3/1) redox depletions; weak medium subangular blocky structure; hard, friable, moderately sticky and slightly plastic; many very fine and fine roots; few very fine pores; 5 percent rounded cobbles and 20 percent rounded pebbles; neutral (pH 7.2); gradual wavy boundary.
Cg2—32 to 44 inches; yellowish brown (10YR 5/4) cobbly sandy clay loam, brown (10YR 4/3) moist; many distinct yellowish red (5YR 5/6) redox concentrations; few faint very dark gray (5Y 3/1) redox depletions; weak coarse subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many very fine and fine roots; few very fine pores; 15 percent rounded cobbles and 15 percent rounded pebbles; neutral (pH 7.2); gradual irregular boundary.
Cg3—44 to 60 inches; yellowish brown (10YR 5/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; many distinct yellowish red (5YR 5/6) redox concentrations; few faint very dark gray (5Y 3/1) redox depletions; massive; slightly hard, friable, moderately sticky and slightly plastic; common very fine and fine roots; few very fine pores; 10 percent rounded cobbles and 35 percent rounded pebbles; neutral (pH 7.2).

Range in Characteristics

Soil temperature: 36 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 10 to 19 inches
Seasonal high water table: At the surface to 12 inches above the surface
Percent of surface covered by stones: 0 to 0.1 percent

A horizon:
Hue—10YR, 2.5Y, or 5Y
Value—2, 2.5, or 3 dry
Chroma—1 or 2
Clay content—18 to 27 percent
Content of rock fragments—5 to 25 percent (0 to 5 percent cobbles, 5 to 20 percent pebbles)
Reaction—pH 6.1 to 7.3

Bw horizon:
Hue—10YR, 2.5Y, or 5Y
Texture—sandy clay loam, loam, or sandy loam
Clay content—18 to 30 percent
Content of rock fragments—10 to 35 percent (0 to 10 percent cobbles, 10 to 25 percent pebbles)
Reaction—pH 6.1 to 7.3

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5 moist; 5, 6, or 7 dry
Texture—loam, sandy clay loam, or sandy loam
Clay content—18 to 30 percent
Content of rock fragments—0 to 50 percent (0 to 15 percent cobbles, 0 to 35 percent pebbles)
Reaction—pH 5.6 to 7.3

Franconi Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, ridges, and side slopes of mountains
Parent material: Local colluvium or residuum derived from granite
Slope range: 4 to 60 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 18 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Fine-loamy, mixed, superactive Ustic Glossocryalfs

Typical Pedon

Franconi gravelly sandy clay loam, in an area of Franconi, very bouldery-Warwood-Caseypeak, very bouldery, complex, 25 to 60 percent slopes; in a forested area, 2,500 feet south and 1,600 feet east of the northwest corner of sec. 11, T. 4 N., R. 7 W.

Oi—2 inches to 0; forest litter of partially decomposed needles, twigs, and leaves.
E—0 to 5 inches; light brownish gray (10YR 6/2) gravelly sandy clay loam, dark grayish brown (10YR 4/2) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium roots; many very fine and fine pores and few medium pores; 5 percent cobbles and 15 percent pebbles; neutral (pH 6.6); clear smooth boundary.
E/Bt—5 to 11 inches; 70 percent light brownish gray (10YR 6/2) gravelly sandy clay loam, grayish brown (10YR 5/2) moist (E part); 30 percent yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist (Bt part); moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium roots; many very fine and few fine pores; few faint clay films bridging sand grains in the Bt part; 20 percent pebbles; moderately acid (pH 6.0); clear smooth boundary.
Bt/E—11 to 19 inches; 85 percent yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist (Bt part); 15 percent light brownish gray (10YR 6/2) gravelly sandy clay loam, grayish brown (10YR 5/2) moist (E part); moderate medium and coarse prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots and few fine and medium roots; many very fine and few fine pores; many faint clay films on faces of peds and bridging sand grains in the Bt part; 20 percent pebbles; slightly acid (pH 6.2); clear wavy boundary.
Bt1—19 to 28 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium and coarse prismatic structure parting to strong fine and medium subangular blocky; hard, firm, moderately sticky and slightly plastic; common very fine roots and few fine and medium roots; many very fine and few fine pores; many faint clay films on faces of peds and bridging sand grains; 5 percent cobbles and 25 percent pebbles; moderately acid (pH 5.8); clear wavy boundary.
Bt2—28 to 34 inches; brown (7.5YR 5/4) gravelly clay loam, dark brown 7.5YR 4/4) moist; weak coarse prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; common very fine and few fine pores; common faint clay films on faces of peds and bridging sand grains; 20 percent pebbles; moderately acid (pH 6.0); clear smooth boundary.
Cr—34 to 38 inches; pale brown (10YR 6/3), decomposed granite bedrock (grus) that crushes to very gravelly coarse sand.
R—38 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 8 to 15 inches
Depth to Cr horizon: 20 to 38 inches
Depth to R layer: 23 to 40 inches
Percent of surface covered by boulders: 1 to 3 percent

E horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 4 or 5 moist
Chroma—2 or 3
Texture—coarse sandy loam or sandy clay loam
Clay content—10 to 25 percent
Content of rock fragments—15 to 50 percent (0 to 20 percent cobbles, 15 to 30 percent pebbles)
Reaction—pH 6.1 to 7.3

E/Bt horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry, 5 or 6 moist (E part); 5 or 6 dry, 4 or 5 moist (Bt part)

Chroma—2, 3, or 4
Texture—sandy loam or sandy clay loam (E part)
Clay content—10 to 25 percent
Content of rock fragments—10 to 35 percent (0 to 10 percent cobbles, 10 to 25 percent pebbles)
Reaction—pH 5.6 to 6.5

Bt/E horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry, 4 or 5 moist (Bt part); 6 or 7 dry, 5 or 6 moist (E part)
Chroma—2, 3, or 4
Texture—sandy loam or sandy clay loam (E part)
Clay content—15 to 30 percent
Content of rock fragments—10 to 35 percent (0 to 5 percent cobbles, 10 to 30 percent pebbles)
Reaction—pH 5.6 to 6.5

Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—3 or 4
Texture—sandy clay loam or clay loam
Clay content—20 to 35 percent
Content of rock fragments—10 to 35 percent (0 to 5 percent cobbles, 10 to 25 percent pebbles)
Reaction—pH 5.6 to 6.5

Geohrock Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Stream terraces, alluvial fans, and valley floors
Parent material: Gravelly alluvium derived from mixed rock sources
Slope range: 1 to 45 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Aridic Haplustalfs

Typical Pedon

Geohrock cobbly clay loam, 15 to 35 percent slopes, stony, in rangeland, 850 feet south and 1,350 feet east of the northwest corner of sec. 1, T. 2 N., R. 5 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) cobbly clay loam, dark brown (10YR 3/3) moist; strong fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 15 percent rounded cobbles and 15 percent rounded pebbles; neutral (pH 7.2); clear smooth boundary.

Bt—4 to 8 inches; brown (10YR 4/3) gravelly clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium angular blocky structure; hard, firm, moderately sticky and moderately plastic; many very fine and fine roots; many very fine pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds and bridging sand grains; 5 percent rounded cobbles and 20 percent rounded pebbles; few faint lime coatings on undersides of fragments; slightly effervescent; slightly alkaline (pH 7.8); clear wavy boundary.

Btk—8 to 17 inches; brown (10YR 5/3) very gravelly clay loam, brown (10YR 4/3) moist; moderate medium angular blocky structure; hard, firm, moderately sticky and moderately plastic; many very fine and fine roots; many very fine pores; common faint dark grayish brown (10YR 4/2) clay films on faces of peds and bridging sand grains; 10 percent rounded cobbles and 30 percent rounded pebbles; disseminated lime, common distinct lime coatings on fragments; strongly effervescent; moderately alkaline (pH 8.4); gradual smooth boundary.

Bk1—17 to 24 inches; pale brown (10YR 6/3) very gravelly sandy clay loam, brown (10YR 5/3) moist; weak coarse subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common very fine and fine roots; many very fine pores; 15 percent rounded cobbles and 35 percent rounded pebbles; disseminated lime, common distinct lime casts around fragments; violently effervescent; strongly alkaline (pH 8.6); gradual irregular boundary.

Bk2—24 to 60 inches; pale brown (10YR 6/3) very gravelly sandy clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; few very fine pores; 10 percent rounded cobbles and 35 percent rounded pebbles; disseminated lime, common distinct lime casts on fragments; strongly effervescent; strongly alkaline (pH 8.6).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 5 to 9 inches
Depth to Btk or Bk horizon: 7 to 12 inches
Percent of surface covered by stones: 0 to 0.1 percent

A horizon:
Hue—2.5Y, 10YR, or 7.5YR

Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2 or 3
Texture—loam or clay loam
Clay content—18 to 35 percent
Content of rock fragments—15 to 35 percent (0 to 15 percent cobbles, 15 to 20 percent pebbles)
Calcium carbonate equivalent—0 to 3 percent
Reaction—pH 6.6 to 7.8

Bt horizon:
Hue—2.5Y, 10YR, or 7.5YR
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2, 3, or 4
Clay content—27 to 35 percent
Content of rock fragments—20 to 60 percent (0 to 10 percent cobbles, 20 to 50 percent pebbles)
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 7.4 to 8.4

Btk horizon:
Hue—2.5Y, 10YR, or 7.5YR
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Texture—loam, sandy clay loam, or clay loam
Clay content—15 to 35 percent
Content of rock fragments—25 to 60 percent (0 to 10 percent cobbles, 25 to 50 percent pebbles)
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 8.4

Bk horizon:
Hue—2.5Y or 10YR
Value—6 or 7 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—sandy clay loam, sandy loam, or loam
Clay content—10 to 25 percent
Content of rock fragments—35 to 80 percent (0 to 15 percent cobbles, 35 to 75 percent pebbles)
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 9.0

Gnojek Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Ridges, escarpments, and side slopes of hills
Parent material: Residuum derived from hard, fine grained sandstone or fine grained igneous rock
Slope range: 2 to 70 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 38 to 42 degrees F
Frost-free period: 80 to 95 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Lithic Argiustolls

Typical Pedon

Gnojek very cobbly loam, stony, in an area of Gnojek, stony-Wickes, stony-Rock outcrop complex, 35 to 70 percent slopes, in rangeland, 40 feet north and 50 feet west of the southeast corner of sec. 22, T. 3 N., R. 4 W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; 25 percent angular cobbles and 20 percent angular pebbles; neutral (pH 7.2); clear wavy boundary.
Bt—3 to 7 inches; dark grayish brown (10YR 4/2) very gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate fine subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; common distinct clay films on faces of peds and bridging sand grains; 15 percent angular cobbles and 35 percent angular pebbles; slightly alkaline (pH 7.4); clear wavy boundary.
Bk—7 to 16 inches; light brownish gray (10YR 6/2) very cobbly loam, brown (10YR 5/3) moist; moderate fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine pores; 25 percent angular cobbles and 30 percent angular pebbles; disseminated lime, common medium masses and threads of lime, common distinct lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.
R—16 inches; hard, brown (10YR 5/3), fine grained sandstone.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)
Thickness of the mollic epipedon: 7 to 10 inches
Depth to argillic horizon: 3 to 7 inches
Depth to Bk horizon: 7 to 16 inches

Depth to bedrock: 10 to 20 inches
Percent of surface covered by stones or boulders: 0.01 to 0.1 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Clay content—15 to 27 percent
Content of rock fragments—35 to 50 percent (15 to 25 percent cobbles, 20 to 25 percent pebbles)
Reaction—pH 6.6 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2, 3, or 4
Texture—loam or clay loam
Clay content—23 to 35 percent
Content of rock fragments—35 to 80 percent (0 to 15 percent stones, 15 to 35 percent cobbles, 20 to 40 percent pebbles)
Reaction—pH 6.6 to 7.8

Bk horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Clay content—18 to 27 percent
Content of rock fragments—35 to 80 percent (0 to 15 percent stones, 15 to 35 percent cobbles, 20 to 40 percent pebbles)
Calcium carbonate equivalent—10 to 25 percent
Reaction—pH 7.4 to 8.4

Handke Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat poorly drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Flood plains, flood-plain steps, and drainageways
Parent material: Recent alluvium
Slope range: 0 to 2 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Sandy, mixed, frigid Oxyaquic Ustifluvents

Typical Pedon

Handke fine sandy loam, in an area of Havre-Ryell-Handke complex, 0 to 2 percent slopes, in rangeland, 1,900 feet south and 700 feet west of the northeast corner of sec. 1, T. 9 N., R. 3 W.

A—0 to 4 inches; grayish brown (2.5Y 5/2) fine sandy loam, dark grayish brown (2.5Y 4/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and few fine roots; 10 percent rounded pebbles; slightly alkaline (pH 7.6); clear smooth boundary.
C1—4 to 9 inches; light brownish gray (2.5Y 6/2) loamy sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose, nonsticky and nonplastic; many very fine and few fine roots; 10 percent rounded pebbles; slightly alkaline (pH 7.8); clear smooth boundary.
C2—9 to 38 inches; light brownish gray (2.5Y 6/2) loamy sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 5 percent rounded pebbles; common faint lime coatings on undersides of fragments; slightly effervescent; slightly alkaline (pH 7.6); clear smooth boundary.
2C3—38 to 60 inches; light yellowish brown (2.5Y 6/4) very fine sandy loam, olive brown (2.5Y 4/4) moist; common fine distinct brownish yellow (10YR 6/6) redox concentrations; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; 5 percent rounded pebbles; slightly alkaline (pH 7.4).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 12 and 36 inches
Depth to seasonal high water table: 24 to 42 inches for periods ranging from 1 week to several weeks during spring runoff
Depth to 2C horizon: 20 to 40 inches

A horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Texture—sandy loam or fine sandy loam
Clay content—5 to 20 percent
Content of rock fragments—0 to 15 percent pebbles
Reaction—pH 6.6 to 7.8

C horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2 or 3
Texture—primarily sand and loamy sand; thin strata of fine sandy loam, sandy loam, and

loam and some evidence of a buried surface layer
Clay content—2 to 10 percent
Content of rock fragments—0 to 15 percent pebbles
Calcium carbonate equivalent—0 to 10 percent
Reaction—pH 6.6 to 8.4

2C horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—3 or 4
Texture—very fine sandy loam, fine sandy loam, sandy loam, or loam
Clay content—5 to 18 percent
Content of rock fragments—0 to 5 percent pebbles
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 6.6 to 8.4

Hanson Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, ridges, and side slopes of mountains
Parent material: Colluvium and slope alluvium derived from limestone
Slope range: 8 to 70 percent
Elevation range: 5,500 to 7,500 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 38 to 42 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, carbonatic Calcic Haplocryolls

Typical Pedon

Hanson gravelly loam, stony, in an area of Tropal, bouldery-Hanson, stony-Rock outcrop complex, 8 to 25 percent slopes, in rangeland, 2,050 feet west and 1,150 feet north of the southeast corner of sec. 3, T. 5 N., R. 2 W.

A—0 to 6 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; 5 percent angular cobbles and 20 percent angular pebbles; few faint lime coatings on undersides of fragments; slightly effervescent; slightly alkaline (pH 7.4); clear wavy boundary.
Bw—6 to 13 inches; grayish brown (10YR 5/2) very gravelly loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine pores; 10 percent angular cobbles and 30 percent angular pebbles; disseminated lime, few distinct lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.
Bk1—13 to 27 inches; white (10YR 8/2) very gravelly loam, light gray (10YR 7/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; 10 percent angular cobbles and 40 percent angular pebbles; disseminated lime, common fine threads and masses of lime, common distinct lime casts around fragments; violently effervescent; moderately alkaline (pH 8.4); gradual irregular boundary.
Bk2—27 to 60 inches; light gray (10YR 7/2) very gravelly loam, pale brown (10YR 6/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; few very fine pores; 15 percent angular cobbles and 40 percent angular pebbles; disseminated lime, few fine masses and threads of lime, common distinct lime casts around fragments; violently effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 12 inches
Depth to Bk horizon: 8 to 16 inches
Percent of surface covered by stones and boulders: 0.1 to 3.0 percent

A horizon:
Value—3, 4, or 5 dry; 2 or 3 moist
Chroma—1 or 2
Clay content—15 to 27 percent
Content of rock fragments—15 to 50 percent (0 to 25 percent stones and cobbles, 15 to 45 percent pebbles)
Calcium carbonate equivalent—0 to 10 percent
Reaction—pH 6.6 to 7.8

Bw horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—loam or clay loam
Clay content—15 to 32 percent

Content of rock fragments—35 to 80 percent (10 to 55 percent stones and cobbles, 10 to 30 percent pebbles or channers)
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 6.6 to 8.4

Bk horizon:
Hue—10YR or 2.5Y
Value—7 or 8 dry; 5, 6, or 7 moist
Chroma—2, 3, or 4
Texture—loam or clay loam
Clay content—15 to 32 percent
Content of rock fragments—35 to 80 percent (10 to 35 percent stones and cobbles, 25 to 45 percent pebbles)
Calcium carbonate equivalent—40 to 60 percent
Reaction—pH 7.4 to 8.4

Hapgood Family

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, escarpments, and side slopes of mountains
Parent material: Colluvium and slope alluvium derived from igneous and metamorphic rock
Slope range: 8 to 60 percent
Elevation range: 5,000 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Pachic Haplocryolls

Typical Pedon

Hapgood gravelly loam, in rangeland, 2,500 feet west and 200 feet north of the southeast corner of sec. 20, T. 6 S., R. 2 W., Madison County, Montana:

A—0 to 18 inches; very dark grayish brown (10YR 3/2) gravelly loam, black (10YR 2/1) moist; moderate fine and medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots; 15 percent angular pebbles; slightly acid (pH 6.4); gradual smooth boundary.
C—18 to 60 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak coarse angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; 10 percent angular cobbles and 35 percent angular pebbles; neutral (pH 7.0).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 16 to 60 inches

A horizon:
Value—2, 3, 4, or 5 dry; 2 or 3 moist
Chroma—1, 2, or 3
Clay content—18 to 27 percent
Content of rock fragments—15 to 60 percent (0 to 10 percent stones, 0 to 25 percent angular cobbles, 15 to 35 percent angular pebbles)
Reaction—pH 6.1 to 6.5

C horizon:
Value—4, 5, 6, or 7 dry; 3, 4, or 5 moist
Chroma—2, 3, 4, or 5
Texture—loam or clay loam
Clay content—18 to 32 percent
Content of rock fragments—35 to 60 percent (0 to 5 percent stones, 10 to 20 percent angular cobbles, 25 to 45 percent angular pebbles)
Reaction—pH 6.6 to 7.3

Havre Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Flood plains, flood-plain steps, and drainageways
Parent material: Stratified, calcareous loamy alluvium
Slope range: 0 to 2 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, calcareous, frigid Aridic Ustifluvents

Typical Pedon

Havre loam, in an area of Havre-Ryell-Handke complex, 0 to 2 percent slopes, in rangeland, 2,690 feet south and 2,160 feet west of the northeast corner of sec. 4, T. 1 N., R. 3 W.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; strong medium granular structure; slightly hard,

friable, slightly sticky and slightly plastic; many very fine and fine roots; disseminated lime; slightly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

A2—4 to 9 inches; light brownish gray (10YR 6/2) loam, very dark grayish brown (10YR 5/2) moist; moderate coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine pores; disseminated lime; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

C1—9 to 31 inches; grayish brown (2.5Y 5/2) loam, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine pores; 5 percent rounded pebbles; disseminated lime, few faint lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

C2—31 to 60 inches; light brownish gray (10YR 6/2) loam composed of stratified loam, silt loam, and fine sandy loam; thin strata of gravelly loamy fine sand; grayish brown (10YR 5/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; few very fine pores; 10 percent rounded pebbles; disseminated lime, common faint lime coatings on fragments; strongly effervescent; slightly alkaline (pH 7.6).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Note: Colors in the surface horizon do not meet the requirements for a mollic epipedon after mixing to a depth of 7 inches.

A horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2 or 3
Clay content—15 to 27 percent
Calcium carbonate equivalent—1 to 5 percent
Content of rock fragments—0 to 15 percent pebbles
Reaction—pH 6.6 to 8.4

C horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Texture—loam consisting of strata of loam, silt loam, or fine sandy loam
Clay content—18 to 27 percent
Calcium carbonate equivalent—5 to 10 percent
Content of rock fragments—0 to 15 percent pebbles
Reaction—pH 7.4 to 8.4

Haxby Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Ridges, side slopes of hills, and strath terraces
Parent material: Local colluvium, slope alluvium, and residuum derived from hard, fine grained sandstone or igneous rock
Slope range: 4 to 45 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Coarse-loamy, mixed, superactive, frigid Haplocalcidic Haplustepts

Typical Pedon

Haxby loam, in an area of Haxby-Amesha-Rencot complex, 4 to 15 percent slopes, in rangeland, 1,750 feet north and 1,900 feet west of the southeast corner of sec. 12, T. 2 N., R. 2 W.

A1—0 to 3 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; neutral (pH 7.2); clear wavy boundary.

A2—3 to 5 inches; yellowish brown (10YR 5/4) loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots; common fine and very fine pores; slightly alkaline (pH 7.4); clear smooth boundary.

Bk1—5 to 14 inches; light gray (10YR 7/2) loam, pale brown (10YR 6/3) moist; moderate medium prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine pores; 5 percent pebbles; disseminated lime, common fine masses and threads of lime, common faint lime coatings

on fragments; violently effervescent; moderately alkaline (pH 8.3); gradual wavy boundary.
Bk2—14 to 21 inches; pale yellow (2.5Y 7/4) sandy loam, light yellowish brown (2.5Y 6/4) moist; weak coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; few or common very fine pores; 5 percent pebbles; disseminated lime, common fine masses and threads of lime, common faint lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.
Bk3—21 to 32 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, yellowish brown (10YR 5/4) moist; weak coarse prismatic structure; slightly hard, friable, nonsticky and nonplastic; few very fine roots; few or common very fine and fine pores; 20 percent pebbles; disseminated lime, common masses and threads of lime, common distinct lime coatings on fragments; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
R—32 inches; hard, fine grained igneous bedrock.

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Depth to Bk horizon: 4 to 8 inches
Depth to bedrock: 20 to 40 inches

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2, 3, or 4
Clay content—15 to 25 percent
Content of rock fragments—0 to 15 percent pebbles
Reaction—pH 6.6 to 7.8

Bk1 and Bk2 horizons:
Hue—10YR or 2.5Y
Value—6, 7, or 8 dry; 5, 6, or 7 moist
Chroma—2, 3, or 4
Texture—loam or sandy loam
Clay content—10 to 18
Content of rock fragments—0 to 15 percent pebbles
Calcium carbonate equivalent—15 to 25 percent
Reaction—pH 7.9 to 8.4

Bk3 horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 5 or 6 moist
Chroma—2, 3, or 4
Texture—sandy loam or loam
Clay content—10 to 18 percent
Content of rock fragments—5 to 30 percent pebbles
Calcium carbonate equivalent—5 to 12 percent
Reaction—pH 7.9 to 8.4

Helmville Family

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Mountain side slopes and valleys
Parent material: Colluvium and slope alluvium derived mainly from limestone, sandstone, and igneous rocks
Slope range: 15 to 70 percent
Elevation range: 5,500 to 7,500 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Eutric Haplocryalfs

Typical Pedon

Helmville gravelly loam, in an area of Whitore, stony-Helmville, bouldery-Firada, very stony, complex, 15 to 45 percent slopes; in a forested area, 1,175 feet north and 100 feet west of the southeast corner of sec. 2, T. 5 N., R. 2 W.

Oi—1 inch to 0; partially decomposed forest litter.
E—0 to 1 inch; dark grayish brown (10YR 4/2) gravelly loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine roots; 15 percent pebbles; neutral (pH 7.2); abrupt smooth boundary.
Bt1—1 to 6 inches; brown (10YR 5/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine pores; common faint discontinuous clay films on faces of peds; 35 percent pebbles; slightly alkaline (pH 7.4); gradual wavy boundary.
Bt2—6 to 13 inches; brown (10YR 5/3) very gravelly clay loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots and common medium roots; many very fine pores; common faint continuous clay films on faces of peds and bridging sand grains; 20 percent cobbles and 40

percent pebbles; slightly alkaline (pH 7.6); gradual wavy boundary.

Bt3—13 to 17 inches; brown (10YR 5/3) very cobbly clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots and common medium roots; many very fine and fine pores; common faint continuous clay films on faces of peds and bridging sand grains; 30 percent cobbles and 30 percent pebbles; disseminated lime in the lower part; slightly effervescent; slightly alkaline (pH 7.8); gradual irregular boundary.

Bk1—17 to 24 inches; brown (10YR 5/3) very cobbly clay loam, brown (10YR 4/3) moist; strong fine subangular blocky structure; hard, firm, moderately sticky and moderately plastic; many very fine and fine roots and common medium roots; many very fine and fine pores; 25 percent cobbles and 30 percent pebbles; disseminated lime, common threads and masses of lime, many distinct lime coatings on fragments; strongly effervescent; slightly alkaline (pH 7.8); gradual wavy boundary.

Bk2—24 to 60 inches; very pale brown (10YR 7/3) very gravelly loam, brown (10YR 5/3) moist; massive; slightly hard, firm, slightly sticky and slightly plastic; common very fine roots and few fine and medium roots; common fine and very fine pores; 10 percent cobbles and 25 percent pebbles; disseminated lime, many fine threads and masses of lime, many distinct lime casts on fragments; violently effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 36 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 1 to 9 inches
Depth to Bk horizon: 14 to 28 inches
Percent of surface covered by stones or boulders: 0.01 to 20 percent

E horizon:
- Value—4, 5, or 6 dry; 3, 4, or 5 moist
- Chroma—2, 3, or 4
- Clay content—15 to 27 percent
- Content of rock fragments—15 to 35 percent (0 to 20 percent stones, flagstones, and cobbles; 15 to 30 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bt horizon:
- Value—4, 5, or 6 dry; 3, 4, or 5 moist
- Chroma—2, 3, 4, or 5
- Clay content—20 to 35 percent
- Texture—loam or clay loam
- Content of rock fragments—35 to 70 percent (10 to 35 percent stones and cobbles, 25 to 50 percent pebbles)
- Calcium carbonate equivalent—3 to 15 percent
- Reaction—pH 6.6 to 7.8

Bk horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4 or 5 moist
- Chroma—3, 4, or 5
- Texture—loam, sandy loam, or clay loam
- Clay content—18 to 35 percent
- Content of rock fragments—40 to 90 percent (10 to 45 percent stones and cobbles, 25 to 45 percent pebbles)
- Calcium carbonate equivalent—15 to 40 percent
- Reaction—pH 7.4 to 8.4

Hilger Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, escarpments, and side slopes of hills
Parent material: Slope alluvium or colluvium derived mainly from fine grained igneous rock and hard sandstone
Slope range: 2 to 35 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 95 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Hilger very cobbly loam, very stony, in an area of Hilger, very stony-Hilger, rubbly-Rock outcrop complex, 8 to 35 percent slopes, in rangeland, 1,800 feet south and 1,300 feet west of the northeast corner of sec. 16, T. 4 N., R. 4 W.

A—0 to 8 inches; dark grayish brown (10YR 4/2) very cobbly loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 30 percent cobbles and 25 percent pebbles; slightly alkaline (pH 7.6); clear smooth boundary.

Bt—8 to 14 inches; brown (10YR 5/3) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine pores; continuous faint clay films on faces of peds and on surface of coarse fragments; 35 percent cobbles and 25 percent pebbles; slightly alkaline (pH 7.6); clear smooth boundary.

Bk1—14 to 24 inches; pale brown (10YR 6/3) very cobbly loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; many very fine pores; 35 percent cobbles and 25 percent pebbles; disseminated lime, many fine threads and masses of lime, continuous distinct lime coatings on fragments; violently effervescent; strongly alkaline (pH 8.6); gradual wavy boundary.

Bk2—24 to 60 inches; light yellowish brown (10YR 6/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; common very fine roots; few very fine pores; 40 percent cobbles and 35 percent pebbles; disseminated lime, common fine threads and masses of lime, continuous faint lime coatings on fragments; strongly effervescent; moderately alkaline (pH 8.2).

Range in Characteristics

Soil temperature: 38 to 42 degrees
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 14 inches
Depth to Bt horizon: 6 to 12 inches
Depth to Bk horizon: 13 to 18 inches
Percent of surface covered by stones or boulders: 0 to 20 percent

A horizon:
- Value—3 or 4 dry; 2 or 3 moist
- Clay content—15 to 27 percent
- Content of rock fragments—15 to 60 percent (10 to 35 percent cobbles and stones, 5 to 25 percent pebbles)
- Reaction—pH 6.6 to 7.8

Bt horizon:
- Value—4 or 5 dry; 3 or 4 moist
- Chroma—2, 3, or 4
- Texture—loam, clay loam, or sandy clay loam
- Clay content—25 to 35 percent
- Content of rock fragments—35 to 80 percent (35 to 60 percent cobbles and stones, 10 to 30 percent pebbles)
- Reaction—pH 7.4 to 8.4

Bk horizon:
- Hue—2.5Y or 10YR
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—loam or sandy loam
- Clay content—15 to 27 percent
- Content of rock fragments—35 to 85 percent (25 to 70 percent cobbles and stones, 15 to 35 percent pebbles)
- Calcium carbonate equivalent—15 to 30 percent
- Reaction—pH 7.9 to 9.0

Hiore Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Side slopes of mountains and valleys
Parent material: Slope alluvium and residuum derived from granite
Slope range: 15 to 70 percent
Elevation range: 5,600 to 7,500 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Ustic Eutrocryepts

Typical Pedon

Hiore coarse sandy loam, stony, in an area of Hiore, stony-Kurrie, stony-Caseypeak, very stony, complex, 35 to 60 percent slopes; in a forested area, 300 feet west and 2,600 feet north of the southeast corner of sec. 7, T. 6 N., R. 4 W.

Oi—1 inch to 0; forest litter of partially decomposed needles and twigs.

A1—0 to 2 inches; dark grayish brown (10YR 4/2) coarse sandy loam, very dark brown (10YR 2/2) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine and few medium and coarse roots; 5 percent granite pebbles; neutral (pH 7.0); abrupt smooth boundary.

A2—2 to 7 inches; grayish brown (10YR 5/2) gravelly coarse sandy loam, dark grayish brown (10YR 4/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots and few medium and coarse roots; 15 percent granite pebbles; neutral (pH 7.0); gradual smooth boundary.

Bw1—7 to 22 inches; light brownish gray (10YR 6/2) gravelly coarse sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and few medium roots; common fine pores; 30 percent granite pebbles; neutral (pH 7.2); gradual smooth boundary.
Bw2—22 to 35 inches; light gray (10YR 7/2) very gravelly loamy coarse sand, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few fine and medium roots; 40 percent granite pebbles; neutral (pH 7.2); gradual smooth boundary.
BC—35 to 60 inches; light yellowish brown (10YR 6/4) very gravelly loamy coarse sand, yellowish brown (10YR 5/6) moist; single grain; loose, nonsticky and nonplastic; few medium roots; 60 percent granite pebbles; neutral (pH 7.2).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Percent of surface covered by stones or boulders: 0 to 0.1 percent

A horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 2, 3, or 4 moist
Chroma—2 or 3
Texture—sandy loam or coarse sandy loam
Clay content—8 to 20 percent
Content of rock fragments—5 to 35 percent (0 to 10 percent cobbles or stones, 5 to 25 percent pebbles)
Reaction—pH 5.6 to 7.3

Bw horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2, 3, 4, or 6
Texture—coarse sandy loam or loamy coarse sand
Clay content—8 to 18 percent
Content of rock fragments—25 to 60 percent (0 to 10 percent cobbles, stones, or boulders; 25 to 50 percent pebbles)
Reaction—pH 5.6 to 7.3

BC horizon:
Value—6 or 7 dry; 5 or 6 moist
Chroma—3, 4, 6, or 8
Texture—loamy coarse sand or coarse sandy loam
Clay content—2 to 12 percent
Content of rock fragments—35 to 70 percent (0 to 10 percent cobbles and stones, 35 to 60 percent pebbles)
Reaction—pH 5.6 to 7.3

Holter Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans and side slopes of hills
Parent material: Colluvium derived from igneous and argillite bedrock
Slope range: 8 to 45 percent
Elevation range: 4,400 to 6,200 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Holter channery loam, in an area of Holter-Castner channery loams, 8 to 45 percent slopes, in rangeland, 700 feet west and 600 feet south of the northeast corner of sec. 2, T. 13 N., R. 5 W., Lewis and Clark County, Montana:

A1—0 to 8 inches; dark grayish brown (10YR 4/2) channery loam, very dark grayish brown (10YR 3/2) moist; moderate very thin platy structure parting to moderate very fine granular; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine tubular and interstitial pores; 20 percent channers; moderately acid; gradual smooth boundary.
A2—8 to 12 inches; brown (10YR 5/3) very channery loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; many very fine and few fine roots; many very fine tubular and interstitial pores; 55 percent channers; moderately acid; gradual smooth boundary.
Bt1—12 to 28 inches; yellowish brown (10YR 5/4) extremely channery clay loam, dark brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common very fine and few fine roots; many very fine tubular and interstitial pores; common distinct clay films on faces of peds; 65 percent channers; slightly acid; gradual smooth boundary.
Bt2—28 to 42 inches; brown (10YR 5/3) extremely

channery clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common very fine tubular and interstitial pores; common distinct clay films on faces of peds and clay bridges between sand grains; 65 percent channers; slightly acid; clear smooth boundary.

Bk—42 to 60 inches; brown (10YR 5/3) extremely channery loam, dark yellowish brown (10YR 4/4) moist; weak medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots to a depth of 50 inches and few very fine roots below that depth; many very fine tubular and interstitial pores; 60 percent channers; continuous faint lime casts on undersides of fragments; strongly effervescent; slightly alkaline.

Range in Characteristics

Soil temperature: 42 to 47 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bk horizon: 25 to 50 inches

A1 horizon:
Hue—7.5YR or 10YR
Value—4 or 5 dry; 2 or 3 moist
Chroma—2 or 3
Clay content—15 to 25 percent
Content of rock fragments—15 to 35 percent (0 to 5 percent flagstones, 15 to 30 percent channers)
Reaction—pH 5.6 to 7.3

A2 horizon:
Hue—5YR, 7.5YR, or 10YR
Value—4 or 5 dry; 3 moist
Chroma—2 or 3
Clay content—18 to 27 percent
Content of rock fragments—40 to 65 percent (0 to 5 percent flagstones, 40 to 60 percent channers)
Reaction—pH 5.6 to 7.3

Bt horizon:
Hue—5YR, 7.5YR, or 10YR
Value—5 or 6 dry; 4 or 5 moist
Chroma—3 or 4
Texture—loam or clay loam
Clay content—25 to 35 percent
Content of rock fragments—60 to 80 percent (5 to 10 percent flagstones, 55 to 75 percent channers)
Reaction—pH 6.1 to 7.3

Bk horizon:
Hue—5YR, 7.5YR, or 10YR
Value—6 or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, 4, or 6
Texture—loam or sandy clay loam
Clay content—10 to 25 percent
Content of rock fragments—60 to 80 percent (5 to 10 percent flagstones, 55 to 75 percent channers)
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.4 to 8.4

Hoyt Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans and side slopes of hills
Parent material: Colluvium and slope alluvium derived from fine grained igneous bedrock and till
Slope range: 4 to 60 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 90 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Typic Haplustalfs

Typical Pedon

Hoyt loam, in an area of Lumpgulch, bouldery-Hoyt-Shaboom, very bouldery, complex, 4 to 15 percent slopes; in a forested area, 2,600 feet north and 2,500 feet east of the southwest corner of sec. 33, T. 9 N., R. 2 W.

Oi—2 inches to 0; partially decomposed twigs and needles.

A—0 to 8 inches; brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; 10 percent granite pebbles; moderately acid (pH 5.7); clear smooth boundary.

Bt1—8 to 21 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to weak fine subangular blocky; many very fine and fine roots and few medium and coarse roots; many very fine pores; common discontinuous faint clay films on faces of peds and bridging sand grains; 10 percent granite pebbles; slightly acid (pH 6.4); clear wavy boundary.

Bt2—21 to 42 inches; light olive brown (2.5Y 5/4) gravelly sandy clay loam, olive brown (2.5Y 4/4) moist; moderate medium prismatic structure parting to moderate fine subangular blocky; many very fine and fine roots and few medium and coarse roots; many very fine pores; common discontinuous distinct clay films on faces of peds and bridging sand grains; 15 percent granite pebbles; slightly acid (pH 6.5); clear wavy boundary.
Bt3—42 to 60 inches; brown (10YR 5/3) gravelly sandy clay loam, brown (10YR 4/3) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium and coarse roots; common very fine pores; few discontinuous faint clay films on faces of peds and bridging sand grains; 20 percent granite pebbles; neutral (pH 6.6).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 6 to 13 inches
Percent of surface covered by stones or boulders: 0 to 3 percent

A horizon:
Value—4 or 5 dry; 2 or 3 moist
Chroma—2 or 3
Texture—loam or sandy clay loam
Clay content—18 to 27 percent
Content of rock fragments—0 to 15 percent (0 to 5 percent cobbles, 0 to 10 percent pebbles)
Reaction—pH 5.6 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3 or 4 moist
Chroma—3 or 4
Texture—clay loam, sandy clay loam, or loam
Clay content—18 to 35 percent
Content of rock fragments—10 to 35 percent (0 to 5 percent cobbles, 10 to 30 percent pebbles)
Reaction—pH 6.1 to 7.3

Jeffcity Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Ridges and side slopes of hills
Parent material: Slope alluvium and residuum derived from granite
Slope range: 2 to 45 percent
Elevation range: 5,000 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Jeffcity loam, in an area of Placerton-Connieo-Jeffcity complex, 4 to 15 percent slopes, in rangeland, 950 feet south and 200 feet east of the northwest corner of sec. 11, T. 5 N., R. 5 W.

A—0 to 7 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine and fine and few medium pores; 5 percent granite pebbles; neutral (pH 7.2); clear smooth boundary.
Bt—7 to 14 inches; yellowish brown (10YR 5/4) gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; many very fine and few fine roots; many very fine and few fine pores; common faint clay films on faces of peds and bridging sand grains; 30 percent granite pebbles; neutral (pH 7.3); gradual wavy boundary.
Bk—14 to 33 inches; light olive brown (2.5Y 5/4) gravelly coarse sandy loam, olive brown (2.5Y 4/4) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few very fine roots; common very fine pores; 30 percent granite pebbles; disseminated lime, many medium and large seams and masses of lime; strongly effervescent; moderately alkaline (pH 8.0); gradual irregular boundary.
Cr—33 to 38 inches; light olive brown (2.5Y 5/4), decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand or loamy coarse sand.
R—38 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches

Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bt horizon: 4 to 8 inches
Depth to Bk horizon: 13 to 20 inches
Depth to Cr horizon: 20 to 38 inches
Depth to R layer: 23 to 40 inches
Percent of surface covered by stones or boulders: 0 to 0.1 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 2 or 3 moist
Chroma—2 or 3
Texture—coarse sandy loam or loam
Clay content—10 to 25 percent
Content of rock fragments—0 to 15 percent pebbles
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—3 or 4
Texture—sandy clay loam or clay loam
Clay content—20 to 30 percent
Content of rock fragments—5 to 35 percent pebbles
Reaction—pH 6.6 to 7.8

Bk horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—coarse sandy loam or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—15 to 45 percent pebbles
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 8.4

Judco Series

Depth class: Deep (40 to 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Divides and side slopes of mountains
Parent material: Colluvium, slope alluvium, and residuum derived from welded tuff bedrock
Slope range: 15 to 60 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Vitrandic Eutrocryepts

Typical Pedon

Judco very gravelly sandy loam, in a forested area, 400 feet east and 2,100 feet south of the northwest corner of sec. 14, T. 3 N., R. 11 W., Deer Lodge County, Montana:

Oe—2 inches to 0; well decomposed needles, twigs, and leaves.
A1—0 to 2 inches; dark gray (10YR 4/1) very gravelly sandy loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium roots; 10 percent cobbles and 30 percent pebbles; strongly acid (pH 5.4); clear wavy boundary.
A2—2 to 4 inches; gray (10YR 5/1) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and few medium and coarse roots; many very fine pores; 10 percent cobbles and 30 percent pebbles; moderately acid (pH 5.6); clear wavy boundary.
Bw—4 to 10 inches; yellowish brown (10YR 5/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and few medium and coarse roots; many very fine pores; 10 percent cobbles and 30 percent pebbles; moderately acid (pH 6.0); clear wavy boundary.
BC1—10 to 21 inches; light gray (2.5Y 7/2) very gravelly sandy loam, dark grayish brown (2.5Y 4/2) moist; weak medium and coarse subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common fine pores; 10 percent cobbles and 45 percent pebbles; slightly acid (pH 6.4); gradual wavy boundary.
BC2—21 to 38 inches; light gray (2.5Y 7/2) very gravelly sandy clay loam, grayish brown (2.5Y 5/2) moist; weak coarse subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; common very fine and fine roots and few medium roots; common fine pores; 5 percent cobbles and 45 percent pebbles; neutral (pH 6.6); gradual wavy boundary.
C—38 to 58 inches; light gray (10YR 7/2) very gravelly sandy clay loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; few very fine, fine, and medium roots; 5 percent cobbles and 45 percent pebbles; neutral (pH 6.6); clear wavy boundary.

Cr—58 to 60 inches; light gray (10YR 7/2), decomposing welded tuff bedrock that crushes to very gravelly sandy loam.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Content of volcanic glass: More than 30 percent in the coarse silt and sand fraction of one or more horizons
Depth to Cr horizon: 50 to 60 inches
Percent of surface covered by stones or boulders: 0.01 to 0.1 percent

A1 horizon:
Hue—10YR or 2.5Y
Value—3 or 4 dry; 2 or 3 moist
Chroma—1 or 2
Clay content—18 to 27 percent
Content of rock fragments—15 to 60 percent (0 to 30 percent cobbles and stones, 15 to 30 percent pebbles)
Reaction—pH 5.1 to 6.5

A2 horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 3, 4, or 5 moist
Chroma—1 or 2
Texture—loam, sandy loam, or sandy clay loam
Clay content—18 to 27 percent
Content of rock fragments—35 to 60 percent (5 to 15 percent cobbles and stones, 30 to 45 percent pebbles)
Reaction—pH 5.1 to 6.5

Bw horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—loam, sandy loam, or sandy clay loam
Clay content—18 to 27 percent
Content of rock fragments—35 to 55 percent (5 to 15 percent cobbles and stones, 30 to 40 percent pebbles)
Reaction—pH 5.6 to 7.3

BC and C horizons:
Hue—10YR, 2.5Y, or 5Y
Value—6 or 7 dry; 4, 5, or 6 moist
Chroma—1 or 2
Texture—loam, sandy loam, or sandy clay loam
Clay content—15 to 27 percent
Content of rock fragments—35 to 60 percent (5 to 15 percent cobbles and stones, 30 to 45 percent pebbles)
Reaction—pH 5.6 to 7.3

Judell Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Stream terraces, alluvial fans, and side slopes of hills
Parent material: Slope alluvium and colluvium derived from limestone
Slope range: 1 to 35 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Fine-loamy, carbonatic, frigid Typic Calciustolls

Typical Pedon

Judell loam, 2 to 8 percent slopes, in rangeland, 1,675 feet north and 1,825 feet west of the southeast corner of sec. 35, T. 4 N., R. 2 W.

A—0 to 5 inches; grayish brown (2.5Y 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; 5 percent pebbles; disseminated lime; slightly effervescent; slightly alkaline (pH 7.5); clear wavy boundary.
Bk1—5 to 12 inches; light brownish gray (2.5Y 6/2) gravelly loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine pores; 20 percent pebbles; disseminated lime, common fine masses of lime, common faint lime coatings on undersides of fragments; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.
Bk2—12 to 26 inches; light gray (2.5Y 7/2) gravelly loam, grayish brown (2.5Y 5/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common fine pores; 25 percent pebbles; disseminated lime, many fine and medium masses of lime, common distinct lime casts on fragments; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.
Bk3—26 to 60 inches; light gray (2.5Y 7/2) gravelly loam, brown (10YR 5/3) moist; massive; slightly

hard, friable, nonsticky and nonplastic; common very fine roots; 30 percent pebbles; disseminated lime, many fine and medium masses of lime, common distinct lime casts on fragments; violently effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 9 inches
Depth to Bk horizon: 5 to 10 inches
Percent of surface covered by stones or boulders: 0 to 3 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 2 or 3 moist
Chroma—1 or 2
Clay content—18 to 27 percent
Content of rock fragments—5 to 45 percent (0 to 20 percent cobbles and stones, 5 to 25 percent pebbles)
Calcium carbonate equivalent—3 to 10 percent
Reaction—pH 7.4 to 8.4

Bk horizon:
Hue—10YR or 2.5Y
Value—6, 7, or 8 dry; 4, 5, or 6 moist
Chroma—2 or 3
Clay content—18 to 27 percent
Content of rock fragments—15 to 35 percent (0 to 5 percent cobbles and stones, 5 to 30 percent pebbles)
Calcium carbonate equivalent—15 to 60 percent (one or more horizons averaging 40 to 60 percent)
Reaction—pH 7.9 to 9.0

Kadygulch Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, escarpments, and side slopes of hills
Parent material: Colluvium and slope alluvium derived from fine grained and coarse grained igneous rocks
Slope range: 35 to 60 percent
Elevation range: 4,400 to 5,800 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Haplustepts

Typical Pedon

Kadygulch gravelly loam, in an area of Kadygulch-Roegulch, stony, complex, 35 to 60 percent slopes; in a forested area, 1,900 feet north and 1,200 feet west of the southeast corner of sec. 14, T. 7 N., R. 4 W.

Oi—2 inches to 0; partially decomposed twigs and needles.
A—0 to 4 inches; very dark grayish brown (10YR 3/2) gravelly loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; many fine roots and common medium and coarse roots; 20 percent pebbles; slightly acid (pH 6.4); clear smooth boundary.
E—4 to 11 inches; pale brown (10YR 6/3) very gravelly coarse sandy loam, brown (10YR 5/3) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots and few coarse roots; 40 percent pebbles; slightly acid (pH 6.2); abrupt smooth boundary.
Bw1—11 to 19 inches; light yellowish brown (10YR 6/4) very gravelly coarse sandy loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots and few coarse roots; common very fine, fine, and medium pores; 35 percent pebbles; moderately acid (pH 5.6); clear wavy boundary.
Bw2—19 to 34 inches; very pale brown (10YR 7/4) very gravelly sandy clay loam, yellowish brown (10YR 5/6) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and moderately plastic; few fine, medium, and coarse roots; common very fine, fine, and medium pores; 55 percent pebbles; strongly acid (pH 5.4); clear wavy boundary.
BC—34 to 60 inches; brownish yellow (10YR 6/6) extremely gravelly coarse sandy loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and moderately plastic; few fine, medium, and coarse roots; common very fine, fine, and medium pores; 10 percent cobbles and 55 percent pebbles; strongly acid (pH 5.2).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches

Percent of surface covered by stones or boulders: 0 to 3 percent

A horizon:
- Value—3 or 4 dry; 2 or 3 moist
- Chroma—2 or 3
- Clay content—15 to 25 percent
- Content of rock fragments—15 to 35 percent (0 to 10 percent cobbles and stones, 15 to 25 percent pebbles)
- Reaction—pH 6.1 to 7.3

E horizon:
- Value—6 or 7 dry; 4 or 5 moist
- Chroma—2 or 3
- Texture—sandy loam, coarse sandy loam, or sandy clay loam
- Clay content—15 to 25 percent
- Content of rock fragments—15 to 45 percent (0 to 10 percent cobbles and stones, 15 to 40 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bw horizon:
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—3, 4, or 6
- Texture—sandy loam, coarse sandy loam, or sandy clay loam
- Clay content—18 to 30 percent
- Content of rock fragments—35 to 60 percent (0 to 20 percent cobbles and stones, 30 to 55 percent pebbles)
- Reaction—pH 5.1 to 6.5

BC horizon:
- Value—6, 7, or 8 dry; 4, 5, or 6 moist
- Chroma—4 or 6
- Texture—loamy sand, loamy coarse sand, sandy loam, or coarse sandy loam
- Clay content—5 to 18 percent
- Content of rock fragments—35 to 70 percent (5 to 25 percent cobbles and stones, 30 to 55 percent pebbles)
- Reaction—pH 5.1 to 6.5

Kalsted Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Remnant stream terraces, alluvial fans, escarpments, ridges, and side slopes of hills
Parent material: Alluvium and colluvium
Slope range: 0 to 60 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Coarse-loamy, mixed, superactive, frigid Aridic Calciustepts

Typical Pedon

Kalsted gravelly sandy loam, 4 to 15 percent slopes, stony, in rangeland, 1,350 feet south and 850 feet east of the northwest corner of sec. 28, T. 4 N., R. 2 W.

A—0 to 3 inches; brown (10YR 4/3) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; 5 percent rounded cobbles and 20 percent rounded pebbles; slightly alkaline (pH 7.4); clear wavy boundary.

Bk1—3 to 18 inches; light gray (10YR 7/2) gravelly sandy loam, grayish brown (10YR 5/2) moist; moderate medium prismatic structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; many fine pores; 5 percent rounded cobbles and 20 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, common faint lime coatings on undersides of fragments; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

Bk2—18 to 30 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine pores; 5 percent rounded cobbles and 25 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, common distinct lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.

Bk3—30 to 60 inches; light brownish gray (10YR 6/2) gravelly sandy loam stratified with thin lenses of loamy sand, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few very fine roots; common very fine pores; 30 percent rounded pebbles; disseminated lime, many fine and medium masses of lime, continuous distinct lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 42 to 46 degrees F

Moisture control section: Between the depths of 8 and 24 inches
Depth to Bk horizon: 5 to 12 inches
Percent of surface covered by stones: 0 to 0.1 percent

A horizon:
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2 or 3
Clay content—5 to 18 percent
Content of rock fragments—5 to 35 percent (0 to 10 percent cobbles, 5 to 25 percent pebbles)
Calcium carbonate equivalent—0 to 10 percent
Reaction—pH 7.4 to 8.4

Bk1 and Bk2 horizons:
Value—6, 7, or 8 dry; 5, 6, or 7 moist
Chroma—2 or 3
Clay content—5 to 18 percent
Content of rock fragments—5 to 35 percent (0 to 5 percent cobbles, 5 to 30 percent pebbles)
Calcium carbonate equivalent—15 to 30 percent
Reaction—pH 7.4 to 8.4

Bk3 horizon:
Value—6, 7, or 8 dry; 5, 6, or 7 moist
Chroma—2, 3, or 4
Texture—sandy loam stratified with more than 50 percent fine and coarser sand
Clay content—5 to 15 percent
Content of rock fragments—5 to 35 percent (0 to 5 percent cobbles, 5 to 30 percent pebbles)
Calcium carbonate equivalent—15 to 30 percent
Reaction—pH 7.9 to 8.4

Kellygulch Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Divides, escarpments, ridges, and side slopes of hills
Parent material: Local colluvium, slope alluvium, and residuum derived from granite
Slope range: 8 to 70 percent
Elevation range: 4,500 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Coarse-loamy, mixed, superactive, frigid Typic Haplustepts

Typical Pedon

Kellygulch coarse sandy loam, very bouldery, in an area of Lumpgulch, very bouldery-Rock outcrop-Kellygulch, very bouldery, complex, 25 to 60 percent slopes; in a forested area, 1,900 feet north and 2,700 feet east of the southwest corner of sec. 29, T. 9 N., R. 2 W.

Oi—2 inches to 0; partially decomposed needles, twigs, and leaves.
A—0 to 5 inches; grayish brown (10YR 5/2) coarse sandy loam, dark grayish brown (10YR 4/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine roots and few fine and medium roots; many very fine and fine pores and few medium pores; 10 percent granite pebbles; slightly acid (pH 6.1); clear smooth boundary.
Bw—5 to 13 inches; brown (10YR 5/3) coarse sandy loam, brown (10YR 4/3) moist; weak coarse subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine roots and few fine and medium roots; many very fine and few fine pores; 10 percent granite pebbles; neutral (pH 6.7); clear wavy boundary.
BC—13 to 27 inches; light brownish gray (2.5Y 6/2) gravelly coarse sandy loam, grayish brown (2.5Y 5/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine roots and few fine and medium roots; many very fine and few fine pores; 20 percent granite pebbles; neutral (pH 6.6); clear wavy boundary.
Cr—27 to 31 inches; pale olive (5Y 6/3), decomposed granite bedrock (grus) that crushes to very gravelly coarse sand or loamy coarse sand.
R—31 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Cr horizon: 20 to 38 inches
Depth to R layer: 23 to 40 inches
Percent of surface covered by stones or boulders: 0 to 15 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry
Chroma—1 or 2
Texture—coarse sandy loam or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—5 to 50 percent (0 to 25 percent cobbles and stones, 5 to 25 percent pebbles)
Reaction—pH 6.1 to 7.3

Bw horizon:
Hue—10YR or 2.5Y

Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Texture—coarse sandy loam or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—10 to 30 percent pebbles
Reaction—pH 6.1 to 7.3

BC horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—coarse sandy loam or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—10 to 35 percent pebbles
Reaction—pH 6.1 to 7.3

Kimpton Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Ridges and side slopes of mountains
Parent material: Local colluvium, slope alluvium, and residuum derived from hard, fine grained sandstone or fine grained igneous rock
Slope range: 15 to 50 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Ustic Haplocryalfs

Typical Pedon

Kimpton very cobbly loam, in an area of Kimpton, very bouldery-Rock outcrop-Tiban, very bouldery, complex, 25 to 50 percent slopes; in a forested area, 300 feet south and 150 feet east of the northwest corner of sec. 4, T. 5 N., R. 2 W.

Oi—1 inch to 0; partially decomposed needles, twigs, and leaves.
A—0 to 4 inches; dark grayish brown (10YR 4/2) very cobbly loam, dark brown (10YR 3/3) moist; moderate medium granular structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots and few medium roots; 20 percent angular cobbles and 25 percent angular pebbles; neutral (pH 6.6); clear wavy boundary.
E—4 to 6 inches; grayish brown (10YR 5/2) very cobbly loam, brown (10YR 4/3) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium roots; 20 percent angular cobbles and 20 percent angular pebbles; slightly acid (pH 6.4); clear wavy boundary.
Bt—6 to 13 inches; brown (10YR 5/3) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; common medium pores; common distinct very dark grayish brown (10YR 3/2) clay films on faces of peds and bridging sand grains; 20 percent angular cobbles and 25 percent angular pebbles; neutral (pH 6.8); clear wavy boundary.
Bk—13 to 32 inches; pale brown (10YR 6/3) very cobbly loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine and fine pores; 25 percent angular cobbles and 25 percent angular pebbles; disseminated lime, common fine and medium masses and threads of lime, common distinct lime coatings on undersides of fragments; strongly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.
R—32 inches; hard, fine grained sandstone bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 6 to 10 inches
Depth to Bk horizon: 11 to 20 inches
Depth to bedrock: 20 to 40 inches
Percent of surface covered by stones or boulders: 0.1 to 3.0 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Clay content—15 to 27 percent
Content of rock fragments—35 to 50 percent (0 to 5 percent stones, 10 to 20 percent cobbles, 25 to 30 percent pebbles)
Reaction—pH 6.1 to 7.3

E horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2 or 3
Texture—loam or fine sandy loam
Clay content—15 to 27 percent

Content of rock fragments—25 to 55 percent (0 to 10 percent stones, 10 to 20 percent cobbles, 15 to 35 percent pebbles)
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 3, 4, or 5 moist
Chroma—2 or 3
Texture—loam, sandy clay loam, or clay loam
Clay content—23 to 35 percent
Content of rock fragments—35 to 60 percent (0 to 5 percent stones, 10 to 20 percent cobbles, 25 to 40 percent pebbles)
Reaction—pH 6.6 to 7.3

Bk horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 5 or 6 moist
Chroma—2 or 3
Texture—loam, sandy clay loam, or fine sandy loam
Clay content—15 to 27 percent
Content of rock fragments—35 to 60 percent (0 to 5 percent stones, 10 to 25 percent cobbles, 25 to 40 percent pebbles)
Calcium carbonate equivalent—12 to 25 percent
Reaction—pH 7.4 to 8.4

Kobarter Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Slow (0.06 to 0.2 inch per hour)
Landform: Alluvial fans, knolls, and side slopes of hills
Parent material: Slope alluvium derived mainly from semiconsolidated shale and siltstone
Slope range: 2 to 35 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine, mixed, superactive, frigid Aridic Haplustepts

Typical Pedon

Kobarter clay loam, 8 to 15 percent slopes, in rangeland, 500 feet west and 600 feet south of the northeast corner of sec. 10, T. 3 N., R. 1 W.

A—0 to 5 inches; brown (10YR 5/3) clay loam, dark grayish brown (10YR 4/2) moist; moderate medium granular structure; slightly hard, friable, slightly sticky and moderately plastic; common fine and very fine roots; 10 percent rounded pebbles; moderately alkaline (pH 8.0); clear smooth boundary.
Bw—5 to 18 inches; pale brown (10YR 6/3) silty clay loam, brown (10YR 5/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; common fine and very fine roots; many fine and very fine pores; 5 percent rounded pebbles; disseminated lime; violently effervescent; moderately alkaline (pH 8.4); gradual smooth boundary.
Bkz—18 to 48 inches; very pale brown (10YR 7/4) silty clay, light yellowish brown (2.5Y 6/4) moist; weak medium prismatic structure parting to moderate medium subangular blocky; very hard, firm, moderately sticky and moderately plastic; few fine and very fine roots; common fine and very fine pores; 5 percent rounded pebbles; disseminated lime, common fine threads of lime; few fine threads of soluble salts; strongly effervescent; moderately alkaline (pH 8.2); gradual smooth boundary.
Bz—48 to 60 inches; pale brown (10YR 6/3) silty clay, brown (10YR 5/3) moist; massive; very hard, firm, moderately sticky and moderately plastic; few very fine roots; few very fine pores; 5 percent rounded pebbles; few fine threads of soluble salts; slightly effervescent; moderately alkaline (pH 8.0).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bkz horizon: 10 to 22 inches

A horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 3 or 4 moist
Chroma—2 or 3
Clay content—27 to 40 percent
Content of rock fragments—0 to 35 percent (0 to 10 percent cobbles, 0 to 25 percent pebbles)
Reaction—pH 7.4 to 8.4

Bw horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Texture—clay loam, silty clay loam, silty clay, or clay
Clay content—30 to 45 percent
Content of rock fragments—0 to 5 percent pebbles
Calcium carbonate equivalent—2 to 10 percent
Reaction—pH 7.4 to 8.4

Bkz horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—clay loam, silty clay loam, silty clay, or clay
Clay content—35 to 45 percent
Content of rock fragments—0 to 5 percent pebbles
Calcium carbonate equivalent—3 to 15 percent
Electrical conductivity—2 to 8 mmhos/cm
Reaction—pH 7.4 to 9.0

Bz horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—clay loam, silty clay loam, silty clay, or clay
Clay content—35 to 45 percent
Content of rock fragments—0 to 5 percent pebbles
Electrical conductivity—4 to 16 mmhos/cm
Calcium carbonate equivalent—2 to 10 percent
Reaction—pH 7.4 to 9.0

Kokoruda Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Alluvial fans, swales, and side slopes of hills
Parent material: Alluvium derived from mixed rock sources
Slope range: 8 to 35 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 22 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 90 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Kokoruda loam, in an area of Kokoruda-Elmark, very bouldery-Rock outcrop complex, 8 to 35 percent slopes; in a forested area, 2,600 feet south and 150 feet east of the northwest corner of sec. 30, T. 9 N., R. 2 W.

Oi—1 inch to 0; partially decomposed leaves, twigs, needles, and roots.
A1—0 to 5 inches; dark gray (10YR 4/1) loam, very dark gray (10YR 3/1) moist; weak medium and fine subangular blocky structure; soft, very friable, moderately sticky and slightly plastic; many very fine roots and few fine, medium, and coarse roots; many very fine and few fine pores; 10 percent rounded pebbles; slightly acid (pH 6.2); clear wavy boundary.
A2—5 to 11 inches; dark gray (10YR 4/1) cobbly loam, very dark gray (10YR 3/1) moist; weak medium and fine subangular blocky structure; soft, very friable, moderately sticky and slightly plastic; many very fine roots and few fine, medium, and coarse roots; 15 percent rounded cobbles and 15 percent rounded pebbles; slightly acid (pH 6.1); clear smooth boundary.
Bt1—11 to 15 inches; pale brown (10YR 6/3) cobbly clay loam, brown (10YR 5/3) moist; weak medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; many very fine roots and few fine, medium, and coarse roots; many very fine and few fine pores; many faint clay films on faces of peds and bridging sand grains; 15 percent rounded cobbles and 10 percent rounded pebbles; neutral (pH 6.6); clear wavy boundary.
Bt2—15 to 33 inches; light yellowish brown (10YR 6/4) cobbly clay loam, brown (10YR 5/3) moist; moderate medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; many very fine roots and few fine and medium roots; many very fine and few fine pores; many faint clay films on faces of peds and bridging sand grains; 15 percent rounded cobbles and 15 percent rounded pebbles; slightly acid (pH 6.1); clear wavy boundary.
BC—33 to 60 inches; pale brown (10YR 6/3) very cobbly clay loam, light olive brown (2.5Y 5/4) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; few very fine and fine roots; common very fine and few fine pores; 20 percent rounded cobbles and 25 percent rounded pebbles; moderately acid (pH 6.0).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bt horizon: 8 to 14 inches

A horizon:
Hue—10YR or 2.5Y
Value—3 or 4 dry; 2 or 3 moist
Clay content—10 to 27 percent

Content of rock fragments—10 to 35 percent (0 to 15 percent cobbles, 10 to 20 percent pebbles)
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 3, 4, or 5 moist
Chroma—2, 3, or 4
Texture—sandy clay loam, loam, or clay loam
Clay content—18 to 35 percent
Content of rock fragments—10 to 35 percent (0 to 15 percent cobbles, 10 to 20 percent pebbles)
Reaction—pH 6.1 to 7.3

BC horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—3, 4, or 6
Texture—sandy loam, sandy clay loam, loam, or clay loam
Clay content—15 to 30 percent
Content of rock fragments—20 to 50 percent (0 to 20 percent cobbles, 20 to 30 percent pebbles)
Reaction—pH 5.6 to 7.3

Kounter Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Ridges and side slopes of hills
Parent material: Residuum derived from granite
Slope range: 4 to 45 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 95 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Lithic Haplustepts

Typical Pedon

Kounter very cobbly coarse sandy loam, in an area of Rock outcrop-Kounter, very bouldery-Jeffcity, bouldery, complex, 15 to 45 percent slopes, in rangeland, 1,150 feet north and 1,175 feet east of the southwest corner of sec. 17, T. 1 N., R. 5 W.

A—0 to 2 inches; dark grayish brown (10YR 4/2) very cobbly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots and few medium roots; 20 percent rounded granite cobbles and 15 percent granite pebbles; neutral (pH 6.8); clear wavy boundary.
Bw—2 to 7 inches; brown (10YR 5/3) very gravelly coarse sandy loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and common fine roots; many very fine and fine pores; 15 percent rounded granite cobbles and 30 percent granite pebbles; disseminated lime, few faint lime coatings on undersides of fragments; slightly effervescent; slightly alkaline (pH 7.4); clear wavy boundary.
Bk—7 to 14 inches; light brownish gray (10YR 6/2) very gravelly coarse sandy loam, brown (10YR 5/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine interstitial pores; 10 percent rounded granite cobbles and 35 percent granite pebbles; disseminated lime, common fine masses and threads of lime, common distinct lime coatings around fragments; violently effervescent; moderately alkaline (pH 8.2); clear smooth boundary.
Cr—14 to 17 inches; light gray (10YR 7/1), decomposed granite bedrock (grus) that crushes to loamy coarse sand.
R—17 inches; hard, light gray (10YR 7/1) granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)
Depth to Bk horizon: 6 to 10 inches
Depth to Cr horizon: 10 to 18 inches
Depth to R layer: 12 to 20 inches
Percent of surface covered by stones or boulders: 0.01 to 3.0 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Clay content—10 to 20 percent
Content of rock fragments—15 to 50 percent (0 to 5 percent stones, 5 to 20 percent cobbles, 10 to 30 percent pebbles)
Reaction—pH 6.1 to 7.3

Bw horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4

Texture—coarse sandy loam or sandy loam
Clay content—8 to 18 percent
Content of rock fragments—35 to 60 percent (0 to 5 percent stones, 5 to 15 percent cobbles, 30 to 40 percent pebbles)
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 6.6 to 7.8

Bk horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 5 or 6 moist
Chroma—2, 3, or 4
Texture—coarse sandy loam or sandy loam
Clay content—5 to 18 percent
Content of rock fragments—35 to 70 percent (0 to 5 percent stones, 0 to 20 percent cobbles, 35 to 45 percent pebbles)
Calcium carbonate equivalent—15 to 25 percent
Reaction—pH 7.4 to 8.4

Kurrie Series

Depth class: Deep (40 to 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, ridges, and side slopes of mountains
Parent material: Slope alluvium and colluvium derived from granitic rock deposited over granite bedrock
Slope range: 15 to 60 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Ustic Glossocryalfs

Typical Pedon

Kurrie very cobbly sandy loam, in an area of Releep, very bouldery-Kurrie, very bouldery-Rock outcrop complex, 15 to 35 percent slopes; in a forested area, 2,100 feet south and 1,500 feet west of the northeast corner of sec. 18, T. 9 N., R. 3 W.

Oi—2 inches to 0; partially decomposed needles, twigs, and leaves.
A—0 to 4 inches; brown (10YR 5/3) very cobbly sandy loam, dark brown (10YR 3/3) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots and few fine and medium roots; many very fine and fine pores; 20 percent cobbles and 15 percent pebbles; neutral (pH 6.6); clear wavy boundary.
E—4 to 9 inches; light gray (2.5Y 7/2) very cobbly sandy loam, grayish brown (2.5Y 5/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, common fine, and few medium and coarse roots; many very fine and fine pores; 5 percent stones, 20 percent cobbles, and 10 percent pebbles; slightly acid (pH 6.1); clear wavy boundary.
E/Bt—9 to 23 inches; 80 percent light gray (2.5Y 7/2) very cobbly sandy loam, grayish brown (2.5Y 5/2) moist (E part); 20 percent light yellowish brown (2.5Y 6/4) very cobbly sandy clay loam, olive brown (2.5Y 4/4) moist (Bt part); weak medium and fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots and few fine, medium, and coarse roots; many very fine and fine pores; many faint clay films bridging sand grains in the Bt part; 5 percent stones, 30 percent cobbles, and 10 percent pebbles; slightly acid (pH 6.3); clear wavy boundary.
Bt—23 to 41 inches; light yellowish brown (2.5Y 6/4) very cobbly sandy clay loam, olive brown (2.5Y 4/4) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; common very fine roots and few fine, medium, and coarse roots; many very fine and few fine pores; many faint clay films bridging sand grains; 30 percent cobbles and 10 percent pebbles; slightly acid (pH 6.5); clear wavy boundary.
BC—41 to 46 inches; grayish brown (2.5Y 5/2) gravelly coarse sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; soft, very friable, slightly sticky and nonplastic; common very fine and few fine roots; many very fine and few fine tubular and interstitial pores; 20 percent pebbles; neutral (pH 6.8); clear wavy boundary.
Cr—46 to 53 inches; light brownish gray (2.5Y 6/2), decomposed granite bedrock (grus) that crushes to gravelly coarse sand.
R—53 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 9 to 28 inches
Depth to Cr horizon: 40 to 58 inches
Depth to R layer: 43 to 60 inches

Percent of surface covered by stones or boulders: 0.01 to 3.0 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—4, 5, or 6 dry; 3, 4, or 5 moist
- Chroma—2, 3, or 4
- Texture—coarse sandy loam or sandy loam
- Clay content—10 to 20 percent
- Content of rock fragments—10 to 60 percent (0 to 10 percent stones, 0 to 25 percent cobbles, 10 to 25 percent pebbles)
- Reaction—pH 6.1 to 7.3

E horizon:
- Hue—10YR or 2.5Y
- Value—6, 7, or 8 dry; 4, 5, or 6 moist
- Chroma—1, 2, or 3
- Texture—coarse sandy loam, sandy loam, or sandy clay loam
- Clay content—10 to 25 percent
- Content of rock fragments—20 to 60 percent (0 to 10 percent stones, 10 to 30 percent cobbles, 10 to 20 percent pebbles)
- Reaction—pH 6.1 to 7.3

E/Bt horizon:
- Hue—10YR or 2.5Y
- Value—6, 7 or 8 dry, 4, 5, or 6 moist (E part); 4, 5, or 6 dry, 3, 4, or 5 moist (Bt part)
- Chroma—1, 2, 3, or 4 (E part); 2, 3, or 4 (Bt part)
- Texture (mixed)—coarse sandy loam, sandy loam, or sandy clay loam
- Clay content—10 to 25 percent
- Content of rock fragments—20 to 60 percent (0 to 10 percent stones, 10 to 30 percent cobbles, 10 to 20 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bt horizon:
- Hue—10YR or 2.5Y
- Value—4, 5, or 6 dry; 3, 4, or 5 moist
- Chroma—2, 3, or 4
- Texture—sandy loam, sandy clay loam, or clay loam
- Clay content—18 to 30 percent
- Content of rock fragments—35 to 60 percent (0 to 5 percent stones, 25 to 35 percent cobbles, 10 to 20 percent pebbles)
- Reaction—pH 6.1 to 7.3

BC horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2, 3, or 4
- Texture—coarse sandy loam or sandy loam
- Clay content—10 to 18 percent
- Content of rock fragments—20 to 50 percent (0 to 10 percent cobbles, 20 to 40 percent pebbles)
- Reaction—pH 6.1 to 7.3

Lahood Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, ridges, and side slopes of mountains
Parent material: Slope alluvium, colluvium, and residuum over sandstone or fine grained igneous rock
Slope range: 2 to 45 percent
Elevation range: 4,000 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls

Typical Pedon

Lahood loam, 2 to 8 percent slopes, in rangeland, 200 feet north and 1,950 feet west of the southeast corner of sec. 8, T. 1 N., R. 1 W.

A—0 to 3 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots; 5 percent pebbles; slightly alkaline (pH 7.8); abrupt smooth boundary.

Bw—3 to 11 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate medium and coarse prismatic structure; hard, firm, moderately sticky and moderately plastic; many fine and very fine roots; common fine pores; 5 percent pebbles; moderately alkaline (pH 8.4); abrupt smooth boundary.

Bk1—11 to 22 inches; very pale brown (10YR 7/3) sandy loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common fine roots; few or common fine pores; 10 percent pebbles; disseminated lime, common fine and medium threads and masses of lime, common faint lime coatings on undersides of fragments; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bk2—22 to 36 inches; pale brown (10YR 6/3) gravelly sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and

nonplastic; few or common fine and very fine roots; few fine pores; 25 percent pebbles; disseminated lime, common fine and medium threads and masses of lime, common distinct lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
R—36 inches; hard, brown (10YR 4/3), coarse grained sandstone.

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Thickness of the mollic epipedon: 7 to 14 inches
Depth to Bk horizon: 10 to 15 inches
Depth to bedrock: 20 to 40 inches
Percent of surface covered by stones: 0 to 0.1 percent

A horizon:
Hue—10YR or 7.5YR
Chroma—2 or 3
Clay content—10 to 18 percent
Content of rock fragments—0 to 35 percent (0 to 10 percent cobbles and stones, 0 to 25 percent pebbles)
Reaction—pH 7.4 to 8.4

Bw horizon:
Hue—10YR or 7.5YR
Value—5 or 6 dry; 3 or 4 moist
Chroma—2 or 3
Texture—loam or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—0 to 35 percent (0 to 10 percent cobbles and stones, 0 to 25 percent pebbles)
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 7.9 to 8.4

Bk horizon:
Value—6 or 7 dry; 5 or 6 moist
Texture—loam, coarse sandy loam, or sandy loam
Clay content—5 to 18 percent
Content of rock fragments—5 to 35 percent (0 to 10 percent cobbles and stones, 5 to 25 percent pebbles)
Calcium carbonate equivalent—15 to 30 percent
Reaction—pH 7.9 to 9.0

Lap Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, divides, ridges, and side slopes of hills
Parent material: Local colluvium and residuum derived from limestone
Slope range: 4 to 70 percent
Elevation range: 4,000 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 39 to 45 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, carbonatic, frigid Lithic Calciustolls

Typical Pedon

Lap very gravelly loam, in an area of Maiden-Lap-Windham complex, 35 to 60 percent slopes, in rangeland, 1,250 feet west and 800 feet south of the northeast corner of sec. 4, T. 1 N., R. 1 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; 5 percent angular cobbles and 40 percent angular limestone pebbles; disseminated lime; slightly effervescent; slightly alkaline (pH 7.6); clear smooth boundary.
Bk1—4 to 7 inches; brown (10YR 5/3) extremely gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; 10 percent angular cobbles and 55 percent angular limestone pebbles; disseminated lime, common fine and medium threads and masses of lime, common distinct lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.0); clear wavy boundary.
Bk2—7 to 18 inches; light brownish gray (10YR 6/2) extremely gravelly loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine pores; 15 percent angular limestone cobbles and 60 percent angular limestone pebbles; disseminated lime, common fine and medium threads and masses of lime, many prominent lime casts around fragments; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
R—18 inches; hard limestone bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the

lithic contact (if it occurs at a depth of less than 12 inches)
Thickness of the mollic epipedon: 7 to 9 inches
Depth to bedrock: 10 to 20 inches
Percent of surface covered by stones or boulders: 0 to 3 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 2 or 3 moist
Chroma—2 or 3
Clay content—18 to 27 percent
Content of rock fragments—35 to 60 percent (0 to 40 percent cobbles and stones, 25 to 45 percent pebbles or channers)
Calcium carbonate equivalent—3 to 15 percent in the particle-size fraction less than 2 mm and more than 40 percent in the particle-size fraction less than 20 mm
Reaction—pH 6.6 to 7.8

Bk horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 3, 4, or 5 moist
Chroma—2 or 3
Clay content—15 to 27 percent
Content of rock fragments—35 to 70 percent (0 to 30 percent cobbles and stones, 30 to 60 percent channers or pebbles)
Calcium carbonate equivalent—40 to 60 percent in the particle-size fraction less than 2 mm and more than 40 percent in the particle-size fraction less than 20 mm
Reaction—pH 7.9 to 9.0

Ledger Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat poorly drained
Permeability: Very slow (less than 0.06 inch per hour)
Landform: Flood plains, flood-plain steps, and drainageways
Parent material: Saline and sodic alluvium derived from mixed rock sources
Slope range: 0 to 2 percent
Elevation range: 3,800 to 5,400 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine, mixed, superactive, calcareous, frigid Oxyaquic Ustifluvents

Typical Pedon

Ledger silty clay loam, in an area of Ledger-Moltoner-Mckenton complex, 0 to 2 percent slopes, in pasture, 2,100 feet south and 2,600 feet east of the northwest corner of sec. 33, T. 2 N., R. 4 W.

Az1—0 to 3 inches; light brownish gray (10YR 6/2) silty clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; disseminated lime; common very fine threads and masses of soluble salt; strongly effervescent; moderately alkaline (pH 8.4); abrupt smooth boundary.
Az2—3 to 7 inches; light brownish gray (10YR 6/2) silty clay loam, brown (10YR 4/3) moist; moderate thin and medium platy structure; slightly hard, very friable, moderately sticky and moderately plastic; many very fine and fine roots and few medium roots; many very fine and fine tubular pores and few medium tubular pores; disseminated lime; common very fine and fine masses and threads of soluble salt; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
Cz1—7 to 16 inches; light gray (10YR 7/2) silty clay loam, grayish brown (10YR 5/2) moist; moderate thick platy structure; slightly hard, very friable, moderately sticky and moderately plastic; many very fine and fine roots; many very fine and fine tubular pores; disseminated lime; few very fine masses and threads of soluble salt; strongly effervescent; strongly alkaline (pH 9.0); clear wavy boundary.
Cz2—16 to 25 inches; gray (10YR 5/1) silty clay loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few very fine roots; common very fine and fine tubular pores; disseminated lime; common very fine and fine masses and threads of soluble salt; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
Ckzg1—25 to 34 inches; grayish brown (10YR 5/2) silty clay loam, dark gray (10YR 4/1) moist; common faint very dark gray (5Y 3/1) redox depletions; few faint strong brown (7.5YR 5/6) redox concentrations; moderate fine subangular blocky structure; hard, firm, moderately sticky and moderately plastic; few very fine roots; common very fine tubular pores; disseminated lime, few very fine masses and threads of lime; common very fine and fine masses and threads of soluble salt; strongly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.
Ckzg2—34 to 60 inches; light brownish gray (10YR 6/2) silty clay loam, dark grayish brown (10YR 4/2)

moist; common faint dark gray (5Y 4/1) redox depletions; massive; very hard, very firm, moderately sticky and moderately plastic; few very fine roots; disseminated lime, few fine and medium masses and threads of lime; common fine masses and threads of soluble salt; slightly effervescent; moderately alkaline (pH 8.3).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to seasonal high water table: 24 to 42 inches for extended periods during spring and early summer

Az horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 2, 3, or 4 moist
Chroma—1, 2, 3, or 4
Texture—silt loam or silty clay loam
Clay content—15 to 40 percent
Electrical conductivity—8 to 20 mmhos/cm
Sodium adsorption ratio—13 to 30
Calcium carbonate equivalent—3 to 10 percent
Reaction—pH 7.9 to 9.6

Cz1 and Cz2 horizons:
Hue—10YR, 2.5Y, or 5Y
Value—5, 6, or 7 dry; 3, 4, or 5 moist
Chroma—1, 2, or 3
Texture—silty clay loam, clay loam, or clay with thin strata of loamy very fine sand, loam, or silt loam
Clay content—35 to 45 percent
Electrical conductivity—8 to 20 mmhos/cm
Sodium adsorption ratio—13 to 30
Calcium carbonate equivalent—10 to 20 percent
Reaction—pH 7.9 to 9.6

Ckzg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4, 5, 6, or 7 dry; 3, 4, or 5 moist
Chroma—1 or 2
Texture—silty clay loam, clay loam, or clay with thin strata of loamy very fine sand, loam, or silt loam
Clay content (weighted average)—25 to 45 percent
Electrical conductivity—8 to 16 mmhos/cm
Sodium adsorption ratio—13 to 30
Calcium carbonate equivalent—15 to 25 percent
Reaction—pH 7.9 to 9.6

Libeg Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, outwash terraces, and side slopes of mountains and mountain valleys
Parent material: Colluvium, alluvium, and till derived from mixed rock sources
Slope range: 1 to 70 percent
Elevation range: 5,500 to 7,500 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Ustic Argicryolls

Typical Pedon

Libeg very gravelly loam, 15 to 35 percent slopes, bouldery, in rangeland, 300 feet east and 300 feet south of the northwest corner of sec. 6, T. 5 N., R. 3 W.

A—0 to 10 inches; dark grayish brown (10YR 4/2) very gravelly loam, black (10YR 2/1) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 10 percent rounded cobbles and 30 percent rounded pebbles; slightly acid (pH 6.4); clear smooth boundary.

Bt1—10 to 17 inches; brown (10YR 5/3) very gravelly clay loam, brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, moderately sticky and slightly plastic; many very fine and fine roots and common medium roots; many very fine pores; common faint clay films on faces of peds; 20 percent rounded cobbles and 40 percent rounded pebbles; neutral (pH 6.6); clear wavy boundary.

Bt2—17 to 31 inches; light yellowish brown (10YR 6/4) very cobbly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; hard, friable, moderately sticky and moderately plastic; many very fine and fine roots and common medium roots; many very fine pores; many distinct clay films on faces of peds and bridging sand grains; 25 percent rounded cobbles and 35 percent rounded pebbles; neutral (pH 6.6); gradual wavy boundary.

Bt3—31 to 60 inches; light yellowish brown (10YR 6/4) extremely cobbly clay loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky

structure; hard, friable, moderately sticky and moderately plastic; common very fine and fine roots; common very fine pores; common distinct clay films on faces of peds and bridging sand grains; 25 percent rounded cobbles and 40 percent rounded pebbles; neutral (pH 6.7).

Range in Characteristics

Soil temperature: 36 to 42 degrees F
Thickness of the mollic epipedon: 8 to 14 inches
Depth to Bt horizon: 8 to 14 inches
Percent of surface covered by stones or boulders: 0 to 15 percent

A horizon:
Value—3 or 4 dry; 2 or 3 moist
Chroma—1 or 2
Texture—loam or silty clay loam
Clay content—15 to 40 percent
Content of rock fragments—5 to 60 percent (0 to 50 percent stones and cobbles, 5 to 50 percent pebbles)
Reaction—pH 6.1 to 7.3

Bt1 and Bt2 horizons:
Hue—7.5YR or 10YR
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2, 3, 4, or 6
Texture—loam, sandy clay loam, or clay loam
Clay content—15 to 35 percent
Content of rock fragments—35 to 80 percent (5 to 50 percent stones and cobbles, 10 to 45 percent pebbles)
Reaction—pH 6.1 to 7.3

Bt3 horizon:
Hue—7.5YR or 10YR
Value—5 or 6 dry; 4 or 5 moist
Chroma—3, 4, or 6
Texture—clay loam, sandy clay loam, or sandy loam
Clay content—10 to 35 percent
Content of rock fragments—35 to 85 percent (5 to 50 percent stones and cobbles, 10 to 40 percent pebbles)
Reaction—pH 5.6 to 7.3

Lowder Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Very poorly drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, swales, moraines, and flood-plain steps
Parent material: Slope alluvium and alpine glacial till derived from hard, fine grained igneous and metamorphic rocks
Slope range: 2 to 25 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, nonacid Typic Cryaquepts

Typical Pedon

Lowder very cobbly loam, in an area of Lowder-Elvick very cobbly loams, 2 to 15 percent slopes, very bouldery; in a forested area, 2,300 feet north and 1,700 feet west of the southeast corner of sec. 31, T. 4 N., R. 3 W.

Oe—2 inches to 0; very dark brown (10YR 2/2) cobbly mucky peat, very dark gray (10YR 3/1) dry; massive; soft, very friable, nonsticky and nonplastic; many very fine and fine roots and common medium roots; 5 percent rounded cobbles and 10 percent rounded pebbles; moderately acid (pH 6.0); abrupt smooth boundary.
A—0 to 2 inches; black (10YR 2/1) cobbly mucky loam, dark gray (10YR 4/1) dry; weak medium subangular blocky structure; many very fine and fine roots and common medium roots; many very fine and fine pores; 5 percent cobbles and 10 percent pebbles; slightly acid (pH 6.2); abrupt smooth boundary.
Bg1—2 to 7 inches; very dark grayish brown (10YR 3/2) very cobbly sandy clay loam, grayish brown (10YR 5/2) dry; common medium faint dark gray (5Y 4/1) redox depletions; moderate medium subangular blocky structure; hard, friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine pores; 20 percent cobbles and 25 percent pebbles; slightly acid (pH 6.4); gradual wavy boundary.
Bg2—7 to 12 inches; dark grayish brown (10YR 4/2) very cobbly sandy clay loam, light brownish gray (10YR 6/2) dry; common medium faint dark gray (5Y 4/1) redox depletions and few fine faint reddish yellow (7.5YR 6/6) redox concentrations; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine and fine roots and few coarse roots; many very fine and fine pores; 25 percent cobbles and 20 percent pebbles; slightly acid (pH 6.4); gradual wavy boundary.
Bg3—12 to 21 inches; dark grayish brown (2.5Y 4/2)

very cobbly coarse sandy loam, light brownish gray (10YR 6/2) dry; few medium faint very dark gray (5Y 3/1) redox depletions and common fine distinct reddish yellow (7.5YR 6/6) redox concentrations; massive; hard, firm, slightly sticky and slightly plastic; common very fine and fine roots and few coarse roots; many very fine and fine pores; 20 percent cobbles and 25 percent pebbles; slightly acid (pH 6.4); gradual irregular boundary.

Bg4—21 to 33 inches; dark brown (10YR 3/3) very gravelly sandy clay loam, light olive brown (2.5Y 5/4) dry; common distinct very dark gray (5Y 3/1) redox depletions and many distinct strong brown (7.5YR 5/8) redox concentrations; massive; hard, firm, slightly sticky and slightly plastic; few very fine, fine, and medium roots; 15 percent cobbles and 35 percent pebbles; slightly acid (pH 6.4); gradual irregular boundary.

BCg—33 to 60 inches; brown (10YR 4/3) very gravelly sandy clay loam, light olive brown (2.5Y 5/4) dry; common medium distinct very dark gray (5Y 3/1) redox depletions and few fine distinct strong brown (7.5YR 5/8) redox concentrations; massive; very hard, friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; 15 percent cobbles and 40 percent pebbles; neutral (pH 6.6).

Range in Characteristics

Soil temperature: 36 to 42 degrees F

Moisture control section: Between the depths of 4 and 12 inches

Water table: At the surface to 12 inches below the surface from May through August

Oe horizon:
- Hue—10YR or 2.5Y
- Value—2 or 3 moist; 3 or 4 dry
- Chroma—1 or 2
- Content of rock fragments—10 to 35 percent (0 to 10 percent stones and cobbles, 10 to 25 percent pebbles)
- Reaction—pH 5.6 to 6.5

A horizon:
- Hue—10YR, 2.5Y, 5Y, or N
- Value—2 or 3 moist; 3 or 4 dry
- Chroma—0, 1, or 2
- Texture—mucky silt loam or mucky loam
- Clay content—15 to 27 percent
- Content of rock fragments—10 to 50 percent (0 to 20 percent stones and cobbles, 10 to 30 percent pebbles)
- Reaction—pH 6.1 to 6.5

Bg1, Bg2, and Bg3 horizons:
- Hue—2.5Y or 10YR
- Value—3 or 4 moist; 5 or 6 dry
- Chroma—2 or 3
- Texture—sandy clay loam or coarse sandy loam
- Clay content—18 to 30 percent
- Content of rock fragments—35 to 60 percent (15 to 25 percent stones and cobbles, 20 to 35 percent pebbles)
- Reaction—pH 6.1 to 6.5

Bg4 horizon:
- Hue—7.5YR, 10YR, or 2.5Y
- Value—3, 4, or 5 moist; 5 or 6 dry
- Chroma—3 or 4
- Texture—coarse sandy loam or sandy clay loam
- Clay content—18 to 30 percent
- Content of rock fragments—35 to 75 percent (0 to 25 percent stones and cobbles, 25 to 55 percent pebbles)
- Reaction—pH 6.1 to 6.5

BCg horizon:
- Hue—7.5YR, 10YR, or 2.5Y
- Value—4 or 5 moist; 5 or 6 dry
- Chroma—3 or 4
- Texture—coarse sandy loam, sandy loam, or sandy clay loam
- Clay content—12 to 27 percent
- Content of rock fragments—35 to 75 percent (0 to 25 percent stones and cobbles, 35 to 50 percent pebbles)
- Reaction—pH 6.1 to 7.3

Lowland Series

Depth class: Very deep (greater than 60 inches)

Drainage class: Well drained

Permeability: Moderate (0.6 inch to 2.0 inches per hour)

Landform: Alluvial fans and side slopes of mountains

Parent material: Colluvium and slope alluvium derived from tuffaceous volcanic rocks

Slope range: 4 to 60 percent

Elevation range: 5,500 to 7,000 feet

Annual precipitation: 15 to 24 inches

Annual air temperature: 36 to 40 degrees F

Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Vitrandic Haplocryolls

Typical Pedon

Lowland loam, 15 to 35 percent slopes, stony, in

rangeland, 1,600 feet west and 1,200 feet north of the southeast corner of sec. 17, T. 6 N., R. 6 W.

A—0 to 12 inches; dark gray (10YR 4/1) loam, black (10YR 2/1) moist; moderate fine and medium granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; neutral (pH 6.8); clear smooth boundary.

Bw—12 to 20 inches; grayish brown (10YR 5/2) cobbly sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine pores; 10 percent cobbles and 20 percent pebbles; neutral (pH 7.2); clear smooth boundary.

BC—20 to 38 inches; light gray (10YR 6/1) very cobbly sandy loam, dark grayish brown (10YR 4/2) moist; weak coarse subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; common fine pores; 15 percent cobbles and 25 percent pebbles; slightly alkaline (pH 7.4); gradual wavy boundary.

C—38 to 60 inches; light gray (10YR 7/1) very cobbly loamy sand, grayish brown (10YR 5/2) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; 15 percent stones, 20 percent cobbles, and 20 percent pebbles; slightly alkaline (pH 7.4).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Thickness of the mollic epipedon: 8 to 16 inches
Content of volcanic glass: More than 30 percent in the coarse silt and sand fraction of one or more horizons (lab data pending)
Percent of surface covered by stones or boulders: 0 to 0.1 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—3, 4, or 5 dry; 2 or 3 moist
- Chroma—1 or 2
- Texture—loam or sandy clay loam
- Clay content—15 to 23 percent
- Content of rock fragments—0 to 25 percent (0 to 5 percent cobbles and stones, 0 to 25 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bw horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—1 or 2
- Texture—loam, sandy clay loam, sandy loam, or coarse sandy loam
- Clay content—12 to 23 percent
- Content of rock fragments—25 to 50 percent (5 to 20 percent cobbles and stones, 20 to 30 percent pebbles)
- Reaction—pH 6.1 to 7.3

BC horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—1 or 2
- Texture—loam, sandy loam, or coarse sandy loam
- Clay content—12 to 20 percent
- Content of rock fragments—35 to 60 percent (10 to 25 percent cobbles and stones, 25 to 35 percent pebbles)
- Reaction—pH 6.1 to 7.8

C horizon:
- Hue—10YR or 2.5Y
- Value—6, 7, or 8 dry; 4, 5, or 6 moist
- Chroma—1 or 2
- Texture—coarse sandy loam, sandy loam, loam, or loamy sand
- Clay content—5 to 18 percent
- Content of rock fragments—35 to 60 percent (10 to 40 percent cobbles and stones, 15 to 50 percent pebbles)
- Reaction—pH 6.1 to 7.8

Lumpgulch Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of hills
Parent material: Local colluvium, residuum, and slope alluvium derived from granite
Slope range: 4 to 60 percent
Elevation range: 4,500 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Typic Haplustalfs

Typical Pedon

Lumpgulch gravelly sandy clay loam, in an area of Lumpgulch, bouldery-Rock outcrop-Elmark, bouldery, complex, 8 to 35 percent slopes; in a forested area,

675 feet north and 875 feet west of the southeast corner of sec. 17, T. 5 N., R. 2 W.

Oi—1 inch to 0; partially decomposed needles, twigs, and leaves.
A—0 to 2 inches; brown (10YR 4/3) gravelly sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, common fine, and few medium and coarse roots; 15 percent granite pebbles; neutral (pH 7.0); clear smooth boundary.
E—2 to 7 inches; light brownish gray (10YR 6/2) gravelly sandy clay loam, brown (10YR 5/3) moist; weak medium and fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, common fine, and few medium and coarse roots; many very fine and few fine pores; 25 percent granite pebbles; neutral (pH 6.6); clear smooth boundary.
Bt—7 to 22 inches; light olive brown (2.5Y 5/4) gravelly sandy clay loam, olive brown (2.5Y 4/4) moist; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium and coarse roots; many very fine and few fine pores; many faint clay films bridging sand grains and on faces of peds; 30 percent granite pebbles; neutral (pH 6.8); clear wavy boundary.
Cr—22 to 27 inches; light olive gray (5Y 6/2), decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand.
R—27 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to the argillic horizon: 7 to 16 inches
Depth to Cr horizon: 20 to 38 inches
Depth to R layer: 23 to 40 inches
Percent of surface covered by boulders: 0.01 to 3.0 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Texture—sandy clay loam, coarse sandy loam, or loam
Clay content—10 to 25 percent
Content of rock fragments—0 to 25 percent pebbles
Reaction—pH 6.1 to 7.3

E horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Texture—coarse sandy loam, sandy loam, or sandy clay loam
Clay content—10 to 25 percent
Content of rock fragments—5 to 25 percent pebbles
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—3 or 4
Texture—sandy clay loam or clay loam
Clay content—20 to 30 percent
Content of rock fragments—10 to 35 percent pebbles
Reaction—pH 6.1 to 7.3

Macabre Series

Depth class: Moderately deep (20 to 40 inches) to decomposing welded tuff and deep (40 to 60 inches) to hard, fractured welded tuff bedrock
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Side slopes of hills and mountains
Parent material: Residuum and slope alluvium derived from welded tuff bedrock
Slope range: 8 to 60 percent
Elevation range: 4,500 to 6,200 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 95 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Vitrandic Argiustolls

Typical Pedon

Macabre very cobbly sandy clay loam, in an area of nonstocked forest, 1,300 feet west and 1,800 feet south of the northeast corner of sec. 35, T. 4 N., R. 11 W., Deer Lodge County, Montana:

A—0 to 9 inches; gray (10YR 5/1) very cobbly sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate very fine and fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 15 percent cobbles and 25 percent pebbles; slightly alkaline (pH 7.4); clear wavy boundary.

Bt—9 to 17 inches; grayish brown (2.5Y 5/2) very cobbly sandy clay loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine, common medium, and few coarse roots; many medium tubular pores; common distinct clay films on faces of peds; 15 percent cobbles and 25 percent pebbles; slightly alkaline (pH 7.6); gradual wavy boundary.

BC—17 to 27 inches; light brownish gray (2.5Y 6/2) very cobbly sandy clay loam, light olive brown (2.5Y 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; common medium tubular pores; 20 percent cobbles and 25 percent pebbles; slightly alkaline (pH 7.8); gradual irregular boundary.

Cr—27 to 41 inches; light gray (N 7/), decomposing welded tuff bedrock.

R—41 inches; light gray (5Y 7/1), fractured, hard welded tuff bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F

Moisture control section: Between the depths of 4 and 12 inches

Content of volcanic glass: More than 30 percent in the coarse silt and sand fraction of one or more horizons

Thickness of the mollic epipedon: 7 to 10 inches

Depth to argillic horizon: 6 to 12 inches

Depth to Cr horizon: 20 to 40 inches

Depth to R layer: 40 to 60 inches

Percent of surface covered by stones or boulders: 0 to 3 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—3, 4, or 5 dry; 2 or 3 moist
- Chroma—1 or 2
- Texture—loam or sandy clay loam
- Clay content—18 to 27 percent
- Content of rock fragments—15 to 45 percent (5 to 15 percent cobbles and stones, 10 to 30 percent pebbles)
- Reaction—pH 6.1 to 7.8

Bt horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2 or 3
- Texture—loam, clay loam, or sandy clay loam
- Clay content—23 to 30 percent
- Content of rock fragments—35 to 60 percent (5 to 25 percent cobbles and stones, 25 to 35 percent pebbles)
- Reaction—pH 6.1 to 7.8

BC horizon:
- Hue—10YR, 2.5Y, or 5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—1, 2, 3, or 4
- Texture—loam, sandy loam, or sandy clay loam
- Clay content—15 to 25 percent
- Content of rock fragments—35 to 60 percent (10 to 25 percent cobbles and stones, 25 to 35 percent pebbles)
- Reaction—pH 6.1 to 7.8

Maiden Series

Depth class: Moderately deep (20 to 40 inches)

Drainage class: Well drained

Permeability: Moderate (0.6 inch to 2.0 inches per hour)

Landform: Escarpments, divides, ridges, and side slopes of hills

Parent material: Local colluvium, residuum, and slope alluvium derived from limestone

Slope range: 4 to 60 percent

Elevation range: 4,400 to 6,000 feet

Annual precipitation: 15 to 19 inches

Annual air temperature: 38 to 42 degrees F

Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, carbonatic, frigid Typic Calciustolls

Typical Pedon

Maiden very gravelly loam, in an area of Maiden-Lap-Windham complex, 15 to 35 percent slopes, in rangeland, 900 feet south and 650 feet east of the northwest corner of sec. 1, T. 1 N., R. 2 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine and very fine roots; 5 percent cobbles and 35 percent pebbles; disseminated lime, few faint coatings of lime on undersides of fragments; strongly effervescent; slightly alkaline (pH 7.8); abrupt wavy boundary.

Ak—4 to 7 inches; grayish brown (10YR 5/2) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; many

very fine and fine pores; 15 percent cobbles and 40 percent pebbles; disseminated lime, common fine threads and masses of light gray (10YR 7/2) lime, few faint lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bk1—7 to 18 inches; light gray (10YR 7/2) very cobbly loam, light brownish gray (10YR 6/2) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; many fine and very fine roots; common fine and many very fine pores; 25 percent cobbles and 30 percent pebbles; disseminated lime, many medium masses and threads of white (10YR 8/2) lime, common distinct lime casts on fragments; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.

Bk2—18 to 26 inches; light brownish gray (10YR 6/2) very cobbly loam, grayish brown (10YR 5/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine roots; few or common very fine pores; 20 percent cobbles and 40 percent pebbles; disseminated lime, many medium masses and threads of white (10YR 8/2) lime, many prominent lime casts on surface of fragments; violently effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.

R—26 inches; light gray (10YR 7/2), hard limestone.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 8 inches
Depth to Bk horizon: 5 to 8 inches
Depth to bedrock: 20 to 40 inches
Percent of surface covered by stones or boulders: 0 to 3 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—4 or 5 dry
- Chroma—2 or 3
- Clay content—15 to 27 percent
- Content of rock fragments—15 to 45 percent (0 to 15 percent cobbles and stones, 15 to 40 percent pebbles)
- Calcium carbonate equivalent—5 to 15 percent
- Reaction—pH 7.4 to 8.4

Bk horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, 7, or 8 dry; 5, 6, or 7 moist
- Chroma—2 or 3
- Clay content—10 to 25 percent
- Content of rock fragments—35 to 70 percent (5 to 25 percent cobbles and stones, 30 to 50 percent pebbles)
- Calcium carbonate equivalent—40 to 60 percent (including rock fragments less than 20 mm in size)
- Reaction—pH 7.9 to 9.0

Marcel Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat poorly drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans; side slopes of mountains
Parent material: Alpine glacial till or slope alluvium derived from hard, fine grained igneous or metamorphic rocks
Slope range: 2 to 25 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Oxyaquic Argicryolls

Typical Pedon

Marcel gravelly loam, in an area of Sebud-Marcel complex, 4 to 25 percent slopes, bouldery, in rangeland, 850 feet south and 2,350 feet east of the northwest corner of sec. 31, T. 4 N., R. 3 W.

Oe—2 inches to 0; decomposed leaves and roots.

A1—0 to 2 inches; very dark grayish brown (10YR 3/2) gravelly loam, black (10YR 2/1) moist; moderate very fine and fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine pores; 5 percent rounded cobbles and 20 percent rounded pebbles; slightly acid (pH 6.2); clear wavy boundary.

A2—2 to 9 inches; very dark gray (10YR 3/1) gravelly loam, black (10YR 2/1) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine pores; 5 percent rounded cobbles and 20 percent rounded pebbles; slightly acid (pH 6.2); gradual wavy boundary.

A3—9 to 18 inches; very dark grayish brown (10YR 3/2) very gravelly loam, black (10YR 2/1) moist; moderate medium subangular blocky structure;

slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine pores; 10 percent rounded cobbles and 25 percent rounded pebbles; slightly acid (pH 6.2); gradual wavy boundary.

Bt1—18 to 24 inches; brown (10YR 4/3) very gravelly sandy clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; many very fine and fine roots; many very fine and fine pores; few faint clay films on faces of peds; 5 percent rounded cobbles and 40 percent rounded pebbles; slightly acid (pH 6.4); gradual irregular boundary.

Bt2—24 to 42 inches; yellowish brown (10YR 5/4) very gravelly sandy clay loam, dark brown (7.5YR 4/4) moist; few faint strong brown (7.5YR 5/6) redox concentrations; moderate medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; common very fine and fine roots; many very fine and fine pores; common faint clay films on faces of peds; 10 percent cobbles and 35 percent pebbles; neutral (pH 6.6); gradual irregular boundary.

Bt3—42 to 60 inches; yellowish brown (10YR 5/4) very gravelly clay loam, dark brown (7.5YR 4/4) moist; common distinct strong brown (7.5YR 5/6) iron concentrations; moderate coarse prismatic structure; hard, firm, moderately sticky and moderately plastic; few very fine and fine roots; common very fine pores; few faint clay films on faces of peds; 10 percent rounded cobbles and 35 percent rounded pebbles; neutral (pH 6.6).

Range in Characteristics

Soil temperature: 36 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 16 to 26 inches
Depth to Bt horizon: 14 to 26 inches
Depth to seasonal high water table: 24 to 42 inches from May through July
Percent of surface covered by stones or boulders: 0.01 to 3.0 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—3 or 4 dry; 2 or 3 moist
- Chroma—1 or 2
- Texture—loam or silt loam
- Clay content—15 to 27 percent
- Content of rock fragments—15 to 40 percent (0 to 15 percent cobbles and stones, 15 to 25 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bt1 horizon:
- Hue—7.5YR or 10YR
- Value—4 or 5 dry; 3 or 4 moist
- Chroma—3 or 4
- Texture—sandy clay loam or clay loam
- Clay content—20 to 30 percent
- Content of rock fragments—35 to 60 percent (5 to 20 percent stones and cobbles, 30 to 40 percent pebbles)
- Reaction—pH 5.6 to 7.3

Bt2 and Bt3 horizons:
- Hue—7.5YR or 10YR
- Value—4 or 5 dry; 3 or 4 moist
- Chroma—3 or 4
- Texture—sandy clay loam or clay loam
- Clay content—22 to 35 percent
- Content of rock fragments—35 to 60 percent (5 to 25 percent stones and cobbles, 30 to 40 percent pebbles)
- Reaction—pH 5.6 to 7.3

Martinsdale Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Alluvial fans, remnant stream terraces, and side slopes of hills
Parent material: Alluvium derived from mixed rock sources
Slope range: 1 to 35 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Martinsdale loam, in an area of Martinsdale, stony-Martinsdale-Hilger complex, 2 to 8 percent slopes, in rangeland, 400 feet west and 1,100 feet south of the northeast corner of sec. 20, T. 4 N., R. 4 W.

A—0 to 6 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; 5 percent rounded pebbles; slightly alkaline (pH 7.4); clear smooth boundary.

Bt1—6 to 9 inches; brown (10YR 5/3) gravelly clay loam, dark brown (10YR 3/3) moist; moderate

medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine pores; common distinct clay films on faces of peds and bridging sand grains; 5 percent rounded cobbles and 15 percent rounded pebbles; slightly alkaline (pH 7.6); clear smooth boundary.

Bt2—9 to 11 inches; pale brown (10YR 6/3) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, moderately sticky and moderately plastic; common fine and very fine roots; many distinct dark brown (10YR 3/3) clay films on faces of peds and bridging sand grains; 5 percent rounded cobbles and 15 percent rounded pebbles; slightly alkaline (pH 7.6); clear wavy boundary.

Bk1—11 to 33 inches; very pale brown (10YR 7/3) gravelly loam, yellowish brown (10YR 5/4) moist; moderate coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; common very fine pores; 5 percent rounded cobbles and 20 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, common faint lime coatings on undersides of fragments; violently effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.

Bk2—33 to 60 inches; very pale brown (10YR 7/3) very gravelly loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; common fine and very fine roots in the upper part and few roots in the lower part; 5 percent rounded cobbles and 30 percent rounded pebbles; disseminated lime, common medium masses and threads of lime, common distinct lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.3).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 12 inches
Depth to Bt horizon: 6 to 12 inches
Depth to Bk horizon: 11 to 30 inches
Percent of surface covered by stones or boulders: 0 to 3 percent

A horizon:
Value—4 or 5 dry; 2 or 3 moist
Chroma—2 or 3
Texture—loam, sandy clay loam, or clay loam
Clay content—18 to 35 percent
Content of rock fragments—0 to 25 percent (0 to 10 percent cobbles, 0 to 15 percent pebbles)
Reaction—pH 6.6 to 7.8

Bt horizon:
Hue—2.5Y or 10YR
Value—4, 5, or 6 dry; 2, 3, or 4 moist
Chroma—2, 3, or 4
Texture—sandy clay loam, loam, or clay loam
Clay content—25 to 35 percent
Content of rock fragments—0 to 15 percent (0 to 5 percent cobbles, 0 to 15 percent pebbles)
Reaction—pH 6.6 to 8.4

Bk horizon:
Hue—10YR or 2.5Y
Value—6, 7, or 8 dry; 4, 5, 6, or 7 moist
Chroma—2, 3, or 4
Texture—loam, clay loam, sandy clay loam, or sandy loam
Clay content—15 to 35 percent
Calcium carbonate equivalent—15 to 35 percent
Content of rock fragments—0 to 35 percent (0 to 5 percent cobbles, 0 to 30 percent pebbles)
Reaction—pH 7.4 to 8.4

Mckenton Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Very poorly drained
Permeability: Slow (0.06 to 0.2 inch per hour)
Landform: Flood plains, flood-plain steps, and drainageways
Parent material: Saline and sodic, recent alluvium derived from mixed rock sources
Slope range: 0 to 2 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine, mixed, superactive, calcareous, frigid Fluvaquentic Endoaquolls

Typical Pedon

Mckenton clay loam, in an area of Ledger-Moltoner-Mckenton complex, 0 to 2 percent slopes, in pasture, 1,800 feet north and 2,400 feet west of the southeast corner of sec. 13, T. 4 N., R. 3 W.

Ag1—0 to 2 inches; very dark grayish brown (2.5Y 3/2) clay loam, dark grayish brown (2.5Y 4/2) dry; many distinct very dark gray (5Y 3/1) redox depletions; moderate medium subangular blocky structure; slightly hard, very friable, moderately sticky and moderately plastic; many very fine and fine roots; many very fine and fine pores; 5 percent rounded pebbles; disseminated lime;

strongly effervescent; very strongly alkaline (pH 9.6); clear wavy boundary.

Ag2—2 to 6 inches; very dark grayish brown (2.5Y 3/2) clay loam, dark grayish brown (2.5Y 4/2) dry; many distinct very dark gray (N 3/) redox depletions; strong medium prismatic structure parting to moderate medium subangular blocky; hard, very firm, very sticky and very plastic; many very fine and fine roots; many very fine and fine pores; 5 percent rounded pebbles; strongly effervescent; very strongly alkaline (pH 9.6); clear wavy boundary.

Bg—6 to 11 inches; very dark grayish brown (2.5Y 3/2) clay loam, grayish brown (2.5Y 5/2) dry; many prominent black (N 2.5/) redox depletions; strong coarse prismatic structure; very hard, very firm, very sticky and very plastic; common very fine and fine roots; common very fine and fine pores; 5 percent rounded pebbles; slightly effervescent; very strongly alkaline (pH 9.2); gradual wavy boundary.

2Bkzg1—11 to 17 inches; dark grayish brown (2.5Y 4/2) gravelly clay loam, light brownish gray (2.5Y 6/2) dry; many distinct very dark gray (5Y 3/1) redox depletions and few distinct strong brown (7.5YR 5/6) redox concentrations; strong coarse and very coarse prismatic structure; very hard, firm, moderately sticky and moderately plastic; common very fine and fine roots; common very fine and fine pores; 15 percent pebbles; disseminated lime, common medium masses and threads of lime, common distinct lime coatings on undersides of pebbles; common medium masses and threads of soluble salt; violently effervescent; moderately alkaline (pH 8.2); gradual irregular boundary.

2Bkzg2—17 to 28 inches; greenish gray (5GY 5/1) and dark gray (5Y 4/1) gravelly clay loam, olive (5Y 5/3) dry; common distinct very dark gray (5Y 3/1) redox depletions and common distinct strong brown (7.5YR 5/6) redox concentrations; massive; hard, firm, moderately sticky and moderately plastic; few very fine roots; common very fine and fine pores; 20 percent rounded pebbles; disseminated lime, few fine masses and threads of lime, few faint lime coatings on pebbles; few fine masses and threads of salt; strongly effervescent; moderately alkaline (pH 8.2); gradual irregular boundary.

2Bkzg3—28 to 45 inches; dark gray (5Y 4/1) and greenish gray (5GY 5/1) gravelly clay loam with thin strata of clay and loam, olive (5Y 5/4) dry; common distinct very dark gray (5Y 3/1) redox depletions; massive; hard, friable, slightly sticky and moderately plastic; few very fine roots; few very fine pores; 30 percent rounded pebbles; disseminated lime, few fine threads of lime; few fine masses and threads of soluble salt; slightly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

2Cg—45 to 60 inches; olive (5Y 4/3) and greenish gray (5GY 5/1), stratified gravelly clay loam and clay, pale olive (5Y 6/3) and greenish gray (5GY 5/1) dry; common distinct very dark gray (5Y 3/1) redox depletions; massive; hard, friable, slightly sticky and moderately plastic; few very fine roots; few very fine pores; 30 percent pebbles; disseminated lime; slightly effervescent; moderately alkaline (pH 8.2).

Range in Characteristics

Soil temperature: 42 to 46 degrees F

Moisture control section: Between the depths of 4 and 12 inches

Thickness of the mollic epipedon: 7 to 11 inches

Depth to Bk horizon: 11 to 15 inches

Water table: At the surface to 12 inches below the surface for extended periods during spring and summer

Ag horizon:

Hue—10YR, 2.5Y, or 5Y
Value—3, 4, or 5 dry; 2 or 3 moist
Chroma—1 or 2
Texture—silty clay loam, clay loam, or silt loam
Clay content—22 to 40 percent
Content of rock fragments—0 to 5 percent pebbles
Electrical conductivity—8 to 20 mmhos/cm
Sodium adsorption ratio—4 to 16
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 7.9 to 9.6

Bg horizon:

Hue—2.5Y or 5Y
Value—4 or 5 dry; 2 or 3 moist
Chroma—1 or 2
Texture—clay loam, silty clay loam, or clay
Clay content—35 to 45 percent
Content of rock fragments—0 to 10 percent pebbles
Electrical conductivity—4 to 16 mmhos/cm
Sodium adsorption ratio—4 to 16
Calcium carbonate equivalent—0 to 10 percent
Reaction—pH 7.9 to 9.6

2Bkzg horizon:

Hue—2.5Y, 5Y, or 5GY
Value—4, 5, or 6 dry; 4 or 5 moist
Chroma—1, 2, 3, or 4

Texture—clay loam, clay, or silty clay loam
Clay content—35 to 45 percent
Content of rock fragments—5 to 35 percent pebbles
Electrical conductivity—2 to 16 mmhos/cm
Sodium adsorption ratio—2 to 13
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 9.6

2Cg horizon:
Hue—5Y, 5GY, or 2.5Y
Value—5, 6, or 7 dry; 3, 4, or 5 moist
Chroma—1, 2, or 3
Texture—clay loam or silty clay loam
Clay content—35 to 40 percent
Content of rock fragments—15 to 45 percent pebbles
Electrical conductivity—2 to 16 mmhos/cm
Sodium adsorption ratio—2 to 13
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 9.6

Meadowcreek Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat poorly drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour) above the 2C horizon and rapid (6.0 to 20 inches per hour) in the 2C horizon
Landform: Drainageways, flood plains, flood-plain steps, and terraces
Parent material: Recent alluvium derived from mixed rock sources
Slope range: 0 to 2 percent
Elevation range: 3,600 to 5,500 feet
Annual precipitation: 10 to 19 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 80 to 115 days

Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Fluvaquentic Haplustolls

Typical Pedon

Meadowcreek loam, in an area of Fairway-Meadowcreek complex, 0 to 2 percent slopes, in pasture, 2,700 feet south and 2,180 feet west of the northeast corner of sec. 4, T. 1 N., R. 3 W.

Ap—0 to 6 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium granular structure; soft, friable, moderately sticky and slightly plastic; many very fine roots; slightly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

A—6 to 14 inches; grayish brown (2.5Y 5/2) loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to weak fine and medium subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; common very fine roots; many fine pores; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

Bg—14 to 27 inches; light brownish gray (2.5Y 6/2) silt loam, dark grayish brown (10YR 4/2) moist; common faint brown (7.5YR 5/4) redox concentrations; weak medium and coarse prismatic structure; slightly hard, friable, moderately sticky and slightly plastic; common very fine roots; many very fine pores; slightly alkaline (pH 7.6); clear smooth boundary.

2C—27 to 60 inches; light brownish gray (10YR 6/2) very gravelly loamy sand, dark grayish brown (10YR 4/2) moist; common faint brown (7.5YR 5/4) redox concentrations; single grain; loose, nonsticky and nonplastic; few very fine roots; 5 percent rounded cobbles and 55 percent rounded pebbles; neutral (pH 7.2).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 10 to 15 inches
Depth to 2C horizon: 20 to 40 inches
Depth to seasonal high water table: 24 to 42 inches

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 2 or 3 moist
Chroma—1 or 2
Texture—loam or silty clay loam
Clay content—18 to 35 percent
Content of rock fragments—0 to 5 percent pebbles
Calcium carbonate equivalent—0 to 10 percent
Reaction—pH 7.4 to 8.4

Bg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5 or 6 dry; 3 or 4 moist
Chroma—1, 2, or 3
Texture—loam, sandy loam, or silt loam
Clay content—18 to 25 percent
Content of rock fragments—0 to 5 percent pebbles
Reaction—pH 6.6 to 7.8

2C horizon:
Texture—sand or loamy sand
Clay content—0 to 10 percent
Content of rock fragments—50 to 75 percent (0 to

15 percent cobbles and stones, 50 to 70 percent pebbles)
Reaction—pH 6.1 to 7.3

Mocmont Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, escarpments, ridges, and side slopes of mountains
Parent material: Colluvium or slope alluvium derived from argillite, fine grained igneous rock, or sandstone
Slope range: 25 to 60 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Haplustalfs

Typical Pedon

Mocmont very cobbly loam, in an area of Mocmont, bouldery-Roegulch, rubbly-Rock outcrop complex, 25 to 60 percent slopes; in a forested area, 1,250 feet east and 1,475 feet south of the northwest corner of sec. 6, T. 4 N., R. 3 W.

Oi—1/2 inch to 0; forest litter of undecomposed and partially decomposed needles, twigs, cones, and leaves.
A—0 to 1 inch; dark gray (10YR 4/1) very cobbly loam, black (10YR 2/1) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine roots; 15 percent cobbles and 25 percent pebbles; slightly alkaline (pH 7.4); clear smooth boundary.
Bt/E—1 to 9 inches; 60 percent light olive brown (2.5Y 5/4) very cobbly clay loam, brown (10YR 4/3) moist (Bt part); 40 percent light gray (10YR 6/1) very gravelly loam, dark gray (10YR 4/1) moist (E part); strong medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; many medium, fine, and very fine roots and common coarse roots; many fine and very fine pores; 10 percent angular cobbles and 35 percent angular pebbles; neutral (pH 7.0); gradual wavy boundary.
Bt1—9 to 21 inches; light olive brown (2.5Y 5/4) very cobbly clay loam, olive brown (2.5Y 4/4) moist; strong medium subangular blocky structure; slightly hard, firm, moderately sticky and moderately plastic; many very fine and fine roots and few medium and coarse roots; many very fine and fine pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds and bridging sand grains; 20 percent angular cobbles and 25 percent angular pebbles; neutral (pH 7.2); gradual wavy boundary.
Bt2—21 to 37 inches; light olive brown (2.5Y 5/4) very gravelly sandy clay loam, olive brown (2.5Y 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; common very fine and fine roots and few coarse roots; many very fine and fine pores; few faint clay films on faces of peds and bridging sand grains; 15 percent angular cobbles and 35 percent angular pebbles; neutral (pH 7.2); gradual wavy boundary.
BC—37 to 50 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine pores; 15 percent angular cobbles and 50 percent angular pebbles; slightly alkaline (pH 7.6); clear wavy boundary.
C—50 to 60 inches; yellowish brown (10YR 5/4) extremely gravelly loamy coarse sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 15 percent angular cobbles and 60 percent angular pebbles; slightly alkaline (pH 7.6).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Percent of surface covered by stones or boulders: 0.01 to 3.0 percent

A horizon:
Value—4, 5, or 6 dry; 2, 3, or 4 moist
Chroma—1 or 2
Clay content—15 to 27 percent
Content of rock fragments—15 to 60 percent (10 to 25 percent cobbles, 5 to 35 percent pebbles)
Reaction—pH 6.1 to 7.8

Bt/E horizon:
Hue—2.5Y or 10YR
Value—6 or 7 dry, 4 or 5 moist (E part); 5 or 6 dry, 4 or 5 moist (Bt part)
Chroma—1, 2, 3, or 4
Texture (mixed)—loam or clay loam
Clay content—10 to 20 percent (E part); 25 to 35 percent (Bt part)
Content of rock fragments—35 to 60 percent (10

to 30 percent cobbles, 25 to 55 percent pebbles)
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—2.5Y or 10YR
Value—5 or 6 dry; 4 or 5 moist
Chroma—3, 4, or 6
Texture—loam, clay loam, or sandy clay loam
Clay content—20 to 35 percent
Content of rock fragments—35 to 85 percent (10 to 30 percent cobbles, 25 to 55 percent pebbles)
Reaction—pH 6.1 to 7.3

BC horizon:
Hue—2.5Y or 10YR
Value—5 or 6 dry; 4 or 5 moist
Chroma—3, 4, or 6
Texture—sandy clay loam, loam, or sandy loam
Clay content—10 to 25 percent
Content of rock fragments—60 to 90 percent (15 to 40 percent cobbles and stones, 35 to 50 percent pebbles)
Reaction—pH 6.1 to 7.8

C horizon:
Hue—2.5Y or 10YR
Value—5 or 6 dry; 4 or 5 moist
Chroma—3, 4, or 6
Texture—loamy coarse sand or loamy sand
Clay content—10 to 15 percent
Content of rock fragments—60 to 90 percent (15 to 40 percent cobbles and stones, 35 to 60 percent pebbles)
Reaction—pH 6.1 to 7.8

Moltoner Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Poorly drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Flood plains, flood-plain steps, and drainageways
Parent material: Saline and sodic alluvium derived from mixed rock sources
Slope range: 0 to 2 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, calcareous, frigid Aeric Fluvaquents

Typical Pedon

Moltoner silt loam, in an area of Ledger-Moltoner-Mckenton complex, 0 to 2 percent slopes, in pasture, 1,700 feet north and 1,900 feet west of the southeast corner of sec. 23, T. 2 N., R. 1 W.

Az—0 to 5 inches; dark brown (10YR 3/3) silt loam, dark grayish brown (10YR 4/2) dry; moderate very fine and fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine pores; disseminated lime; few very fine masses of soluble salt; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Cz1—5 to 20 inches; dark grayish brown (10YR 4/2) silt loam with thin strata of fine and medium sand, grayish brown (10YR 5/2) dry; few faint strong brown (7.5YR 5/6) redox concentrations; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine roots; many very fine pores; disseminated lime; few very fine masses of soluble salt; slightly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Cz2—20 to 27 inches; dark grayish brown (2.5Y 4/2) silt loam, grayish brown (10YR 5/2) dry; common faint strong brown (7.5YR 5/6) redox concentrations; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; common very fine pores; disseminated lime; few very fine masses and threads of soluble salt; slightly effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.

Czg1—27 to 35 inches; grayish brown (2.5Y 5/2) coarse sandy loam consisting of thin layers of loam, silt loam, and coarse sand, light brownish gray (10YR 6/2) dry; common faint very dark gray (5Y 3/1) redox depletions; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; common very fine pores; disseminated lime; few very fine masses and threads of soluble salt; slightly effervescent; moderately alkaline (pH 8.0); abrupt wavy boundary.

Czg2—35 to 49 inches; grayish brown (2.5Y 5/2) loam consisting of thin layers of silt and fine sand, light brownish gray (10YR 6/2) dry; common distinct strong brown (7.5YR 5/6) redox concentrations and common faint dark gray (5Y 4/1) redox depletions; massive; hard, firm, slightly sticky and slightly plastic; few very fine roots; few very fine pores; disseminated lime; few very fine threads of

soluble salt; slightly effervescent; moderately alkaline (pH 8.3); clear wavy boundary.
Cg—49 to 60 inches; grayish brown (2.5Y 5/2) loam consisting of thin layers of loam, clay, and silt loam, light brownish gray (10YR 6/2) dry; many distinct strong brown (7.5YR 5/6) redox concentrations and many distinct dark gray (5Y 4/1) redox depletions; massive; hard, firm, slightly sticky and slightly plastic; few very fine pores; disseminated lime; slightly effervescent; moderately alkaline (pH 8.2).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to the water table: 6 to 24 inches during early spring runoff and during irrigation

Az horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 2, 3, 4, or 5 moist
Chroma—1, 2, or 3
Texture—loam, silt loam, or silty clay loam
Clay content—15 to 30 percent
Content of rock fragments—0 to 15 percent pebbles
Electrical conductivity—8 to 16 mmhos/cm
Sodium adsorption ratio—13 to 30
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 7.9 to 9.6

Cz and Czg horizons:
Hue—10YR, 2.5Y, or 5Y
Value—4, 5, 6, or 7 dry; 3, 4, or 5 moist
Chroma—1 or 2
Texture—loam, clay loam, coarse sandy loam, or silt loam consisting of thin layers of silt, clay, loamy fine sand, fine sand or coarse sand, and sand and gravel
Clay content—18 to 35 percent
Content of rock fragments—0 to 20 percent pebbles
Electrical conductivity—8 to 16 mmhos/cm
Sodium adsorption ratio—13 to 30
Calcium carbonate equivalent—10 to 20 percent
Reaction—pH 7.9 to 9.6

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5, 6, or 7 dry; 3, 4, 5, or 6 moist
Chroma—1 or 2
Texture—loam, clay loam, or silt loam consisting of thin layers of loamy fine sand, fine sand or sand and gravel, silt, and clay
Clay content (weighted average)—18 to 35 percent
Content of rock fragments—0 to 20 percent pebbles
Electrical conductivity—8 to 16 mmhos/cm
Sodium adsorption ratio—4 to 20
Calcium carbonate equivalent—10 to 20 percent
Reaction—pH 7.9 to 9.0

Monaberg Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Alluvial fans and side slopes of mountains
Parent material: Slope alluvium and alpine glacial till derived from hard, fine grained igneous and metamorphic rocks
Slope range: 2 to 35 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Fine-loamy, mixed, superactive Ustic Argicryolls

Typical Pedon

Monaberg gravelly loam, in an area of Libeg-Monaberg gravelly loams, 2 to 15 percent slopes, bouldery, in rangeland, 20 feet east and 2,640 feet south of the northwest corner of sec. 1, T. 4 N., R. 4 W.

A1—0 to 3 inches; very dark grayish brown (10YR 3/2) gravelly loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine roots; 20 percent rounded pebbles; neutral (pH 6.6); clear wavy boundary.
A2—3 to 11 inches; very dark grayish brown (10YR 3/2) gravelly loam, black (10YR 2/1) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine pores; 20 percent rounded pebbles; neutral (pH 6.8); clear wavy boundary.
Bt1—11 to 17 inches; light olive brown (2.5Y 5/4) gravelly clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium prismatic structure parting to strong medium subangular blocky; slightly hard, firm, moderately sticky and moderately plastic; many very fine and fine roots; many very fine pores; common distinct clay films

on faces of peds; 20 percent pebbles; neutral (pH 7.2); clear wavy boundary.
Bt2—17 to 27 inches; light olive brown (2.5Y 5/4) gravelly clay loam, olive brown (2.5Y 4/4) moist; moderate medium prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium roots; many very fine pores; common faint clay films on faces of peds; 15 percent rounded pebbles; slightly alkaline (pH 7.4); gradual wavy boundary.
Bt3—27 to 48 inches; light olive brown (2.5Y 5/4) gravelly clay loam, olive brown (2.5Y 4/4) moist; weak medium and coarse prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium roots; common medium pores; few faint clay films on faces of peds; 25 percent rounded pebbles; slightly alkaline (pH 7.4); gradual irregular boundary.
BC—48 to 60 inches; light yellowish brown (2.5Y 6/4) gravelly loam, olive brown (2.5Y 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; few very fine and fine pores; 30 percent rounded pebbles; slightly alkaline (pH 7.4).

Range in Characteristics

Soil temperature: 36 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 10 to 16 inches
Percent of surface covered by stones or boulders: 0 to 0.1 percent

A horizon:
Value—3 or 4 dry; 2 or 3 moist
Chroma—1 or 2
Clay content—18 to 27 percent
Content of rock fragments—5 to 25 percent (0 to 5 percent cobbles, 5 to 20 percent pebbles)
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—2.5Y or 10YR
Value—4 or 5 dry; 3 or 4 moist
Chroma—3 or 4
Texture—loam, clay loam, or sandy clay loam
Clay content—25 to 35 percent
Content of rock fragments—10 to 35 percent (0 to 5 percent cobbles, 10 to 30 percent pebbles)
Reaction—pH 6.1 to 7.8

BC horizon:
Hue—2.5Y, 10YR, or 7.5YR
Value—5 or 6 dry; 4 or 5 moist
Chroma—3 or 4
Texture—loam, clay loam, or sandy clay loam
Clay content—15 to 30 percent
Content of rock fragments—15 to 35 percent (0 to 5 percent cobbles, 15 to 30 percent pebbles)
Reaction—pH 6.1 to 7.8

Mooseflat Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Very poorly drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Flood plains, flood-plain steps, and drainageways
Parent material: Recent alluvium derived from mixed rock sources
Slope range: 1 to 8 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, superactive Typic Cryaquolls

Typical Pedon

Mooseflat loam, 1 to 4 percent slopes, in pasture, 1,600 feet east and 1,700 feet south of the northwest corner of sec. 22, T. 6 N., R. 6 W.

Oe—0 to 2 inches; black (10YR 2/1) mucky peat, very dark grayish brown (10YR 3/2) dry; neutral (pH 6.8); clear smooth boundary.
A—2 to 10 inches; black (10YR 2/1) loam, gray (10YR 5/1) dry; many fine distinct yellowish brown (10YR 5/6) redox concentrations; moderate medium granular structure; slightly hard, friable, slightly sticky and moderately plastic; many very fine and fine roots; neutral (pH 7.2); clear smooth boundary.
Bg—10 to 18 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; common fine distinct dark yellowish brown (10YR 4/6) redox concentrations; weak thin platy structure; hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine pores; neutral (pH 6.8); abrupt smooth boundary.
BCg—18 to 22 inches; dark gray (10YR 4/1) loamy fine sand, light gray (10YR 7/1) dry; common fine distinct yellowish brown (10YR 5/4) redox concentrations; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine roots; common very fine pores;

5 percent rounded pebbles; neutral (pH 6.8); abrupt smooth boundary.
2Cg—22 to 60 inches; gray (10YR 5/1) very cobbly loamy sand, light gray (10YR 6/1) dry; single grain; loose, nonsticky and nonplastic; 35 percent rounded cobbles and 25 percent rounded pebbles; neutral (pH 7.2).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 10 to 19 inches
Depth to 2Cg horizon: 14 to 26 inches
Seasonal high water table: At the surface to 12 inches below the surface from April through June

A horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 or 5 dry; 2 or 3 moist
Chroma—1 or 2
Clay content—15 to 27 percent
Content of rock fragments—0 to 10 percent cobbles and pebbles
Reaction—pH 5.6 to 7.3

Bg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4, 5, or 6 dry; 2, 3, 4, or 5 moist
Chroma—1 or 2
Texture—loam or silt loam
Clay content—18 to 27 percent
Content of rock fragments—0 to 10 percent cobbles and pebbles
Reaction—pH 6.1 to 7.3

BCg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—6 or 7 dry; 4 or 5 moist
Chroma—1 or 2
Texture—fine sandy loam or loamy fine sand
Clay content—10 to 18 percent
Content of rock fragments—5 to 20 percent (0 to 5 percent cobbles, 5 to 15 percent pebbles)
Reaction—pH 6.1 to 7.3

2Cg horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry
Texture—sand, loamy sand, coarse sand, or loamy coarse sand
Clay content—2 to 12 percent
Content of rock fragments—35 to 70 percent (15 to 50 percent stones and cobbles, 20 to 35 percent pebbles)
Reaction—pH 5.6 to 7.3

Musselshell Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, plains, and side slopes of hills
Parent material: Alluvium derived from limestone
Slope range: 1 to 15 percent
Elevation range: 3,800 to 5,500 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Coarse-loamy, carbonatic, frigid Aridic Calciustepts

Typical Pedon

Musselshell cobbly loam, in an area of Musselshell-Crago cobbly loams, 1 to 4 percent slopes, in rangeland, 60 feet west and 1,600 feet south of the northeast corner of sec. 22, T. 5 N., R. 3 W.

A—0 to 2 inches; dark grayish brown (10YR 4/2) cobbly loam, dark brown (10YR 3/3) moist; moderate medium and fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine roots; 10 percent rounded cobbles and 15 percent rounded pebbles; disseminated lime, common faint lime coatings on undersides of fragments; slightly effervescent; moderately alkaline (pH 7.9); clear smooth boundary.
Bk1—2 to 6 inches; grayish brown (10YR 5/2) cobbly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine pores; 10 percent rounded cobbles and 15 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, common distinct lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.3); clear wavy boundary.
Bk2—6 to 11 inches; light gray (10YR 7/2) gravelly loam, light brownish gray (10YR 6/2) moist; moderate medium prismatic structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine pores; 5 percent rounded cobbles and 15 percent rounded pebbles; disseminated lime, many fine and medium threads and masses of lime, common distinct lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.

Bk3—11 to 33 inches; white (10YR 8/2) gravelly loam, pale brown (10YR 6/3) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine pores; 5 percent rounded cobbles and 20 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, many distinct lime casts on fragments; violently effervescent; strongly alkaline (pH 8.6); gradual wavy boundary.

2C—33 to 60 inches; light gray (10YR 7/2) very gravelly sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine pores; 5 percent rounded cobbles and 45 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, common distinct lime casts around fragments; violently effervescent; strongly alkaline (pH 8.6).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Depth to 2C material: 20 to 40 inches

A horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3 or 4 moist
Chroma—2, 3, or 4
Clay content—20 to 27 percent
Content of rock fragments—15 to 35 percent (0 to 10 percent cobbles and stones, 15 to 25 percent pebbles)
Calcium carbonate equivalent—5 to 10 percent
Reaction—pH 7.4 to 8.4

Bk horizon:
Hue—10YR or 2.5Y
Value—5, 6, 7, or 8 dry; 4, 5, 6, or 7 moist
Chroma—1, 2, 3, or 4
Clay content—10 to 27 percent
Content of rock fragments—10 to 35 percent (0 to 10 percent cobbles, 10 to 25 percent pebbles)
Calcium carbonate equivalent—40 to 60 percent
Reaction—pH 7.9 to 9.0

2C horizon:
Hue—10YR or 2.5Y
Value—5, 6, 7, or 8 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—fine sandy loam, loam, or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—35 to 60 percent (5 to 10 percent cobbles, 30 to 50 percent pebbles)
Calcium carbonate equivalent—40 to 60 percent
Reaction—pH 7.9 to 9.0

Nestley Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat poorly drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour) above the 2C horizon and rapid (6.0 to 20.0 inches per hour) in the 2C horizon
Landform: Flood plains, flood-plain steps, and drainageways
Parent material: Recent alluvium derived from mixed rock sources
Slope range: 0 to 2 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Sandy-skeletal, mixed, frigid Oxyaquic Haplustolls

Typical Pedon

Nestley silt loam, in an area of Nestley-Riverrun-Pieriver complex, 0 to 2 percent slopes, in pasture, 700 feet south and 2,100 feet east of the northwest corner of sec. 2, T. 1 N., R. 3 W.

A1—0 to 1 inch; very dark grayish brown (10YR 3/2) silt loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and moderately plastic; many very fine and fine roots and few medium roots; slightly alkaline (pH 7.6); clear wavy boundary.

A2—1 to 11 inches; dark grayish brown (10YR 4/2) silt loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and moderately plastic; many very fine and few fine roots; many very fine and few fine pores; slightly alkaline (pH 7.8); clear wavy boundary.

Bw—11 to 16 inches; brown (10YR 5/3) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine pores; 5 percent rounded pebbles; slightly alkaline (pH 7.8); abrupt smooth boundary.

2C—16 to 60 inches; light brownish gray (10YR 6/2) very gravelly sand, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots in the upper 12

inches; 50 percent pebbles; few faint lime coatings on fragments; slightly alkaline (pH 7.4).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 12 and 35 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to 2C horizon: 9 to 25 inches
Depth to seasonal high water table: 24 to 42 inches

A horizon:
Hue—10YR or 2.5Y
Value—3 or 4 dry; 2 or 3 moist
Chroma—2 or 3
Texture—loam, silt loam, or clay loam
Clay content—14 to 32 percent
Content of rock fragments—0 to 15 percent (0 to 5 percent stones and cobbles, 0 to 10 percent pebbles)
Reaction—pH 6.6 to 7.8

Bw horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—fine sandy loam or sandy loam with more than 50 percent fine sand or coarser
Clay content—10 to 18 percent
Content of rock fragments—0 to 35 percent (0 to 10 percent stones and cobbles, 0 to 25 percent pebbles)
Reaction—pH 6.6 to 7.8

2C horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2 or 3
Texture—sand, loamy sand, loamy coarse sand, or coarse sand
Clay content—2 to 10 percent
Content of rock fragments—35 to 80 percent (0 to 20 percent cobbles, 35 to 70 percent pebbles)
Reaction—pH 6.6 to 8.4

Nieman Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of mountains
Parent material: Residuum derived from fine grained sandstone or igneous rock
Slope range: 2 to 70 percent
Elevation range: 5,500 to 7,500 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Lithic Argicryolls

Typical Pedon

Nieman very cobbly loam, in an area of Nieman, very stony-Rock outcrop-Libeg, bouldery, complex, 15 to 45 percent slopes, in rangeland, 700 feet north and 75 feet east of the southwest corner of sec. 18, T. 3 N., R. 4 W.

A—0 to 4 inches; brown (10YR 4/3) very cobbly loam, dark brown (10YR 3/3) moist; moderate medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; 20 percent angular cobbles and 25 percent angular pebbles; neutral (pH 6.8); clear wavy boundary.
Bt1—4 to 8 inches; dark grayish brown (10YR 4/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; common faint brown (10YR 4/3) clay films on faces of peds and bridging sand grains; 25 percent angular cobbles and 30 angular percent pebbles; neutral (pH 7.0); clear wavy boundary.
Bt2—8 to 13 inches; dark grayish brown (10YR 4/2) extremely cobbly loam, dark grayish brown (10YR 4/2) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and many very fine roots matted in cracks and on undersides of fragments; many very fine and fine pores; common distinct clay films on faces of peds and bridging sand grains; 35 percent angular cobbles and 35 percent angular pebbles; neutral (pH 7.0).
R—13 inches; hard, fine grained igneous bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)
Thickness of the mollic epipedon: 7 to 12 inches
Depth to Bt horizon: 4 to 7 inches
Depth to bedrock: 10 to 20 inches

Percent of surface covered by stones or boulders: 0.01 to 3.0 percent

A horizon:
Hue—2.5Y or 10YR
Value—3 or 4 dry; 2 or 3 moist
Chroma—2 or 3
Clay content—18 to 27 percent
Content of rock fragments—15 to 50 percent (5 to 20 percent cobbles, 10 to 30 percent pebbles)
Reaction—pH 6.6 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2, 3, or 4
Texture—loam or clay loam
Clay content—18 to 30 percent
Content of rock fragments—35 to 80 percent (5 to 35 percent cobbles, 30 to 45 percent pebbles)
Reaction—pH 6.6 to 7.8

Nippt Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour) to a depth of 15 inches and rapid (6 to 20 inches per hour) below this depth
Landform: Stream terraces and flood-plain steps
Parent material: Alluvium
Slope range: 0 to 4 percent
Elevation range: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Taxonomic classification: Sandy-skeletal, mixed, frigid Aridic Haplustalfs

Typical Pedon

Nippt gravelly loam, in an area of Nippt-Geohrock gravelly loams, 2 to 4 percent slopes, in rangeland, 2,300 feet north and 1,600 feet east of the southwest corner of sec. 25, T. 12 N., R. 5 W., Lewis and Clark County, Montana:

E—0 to 3 inches; light brownish gray (10YR 6/2) gravelly loam, dark brown (10YR 4/3) moist; moderate very thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine vesicular pores; 15 percent pebbles; slightly alkaline; clear smooth boundary.
Bt—3 to 9 inches; brown (10YR 5/3) gravelly clay loam, dark brown (10YR 4/3) moist; moderate medium prismatic structure; hard, friable, sticky and plastic; common very fine and fine roots; many very fine tubular and interstitial pores; many distinct dark brown (10YR 3/3 moist) clay films on faces of peds; 25 percent pebbles; slightly alkaline; clear smooth boundary.
Bk1—9 to 15 inches; light gray (10YR 7/2) extremely gravelly sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; continuous distinct lime casts on undersides of pebbles; 60 percent pebbles; violently effervescent; moderately alkaline; clear smooth boundary.
2Bk2—15 to 60 inches; light gray (10YR 7/2) extremely gravelly sand, dark brown (10YR 4/3) moist; single grain; loose, nonsticky and nonplastic; common fine and very fine roots; continuous faint lime casts on undersides of pebbles; 65 percent pebbles; strongly effervescent; strongly alkaline.

Range in Characteristics

Soil temperature: 42 to 47 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bk horizon: 5 to 10 inches
Depth to 2Bk horizon: 10 to 20 inches

E horizon:
Hue—10YR or 7.5YR
Value—6 dry; 3 or 4 moist
Chroma—2 or 3
Clay content—15 to 25 percent
Content of rock fragments—15 to 60 percent (0 to 30 percent cobbles, 5 to 30 percent pebbles)
Reaction—pH 6.6 to 7.8

Bt horizon:
Hue—10YR or 7.5YR
Value—5 or 6 dry; 3 or 4 moist
Chroma—3 or 4
Clay content—27 to 35 percent
Content of rock fragments—20 to 60 percent (0 to 20 percent cobbles, 15 to 50 percent pebbles)
Reaction—pH 6.6 to 7.8

Bk horizon:
Hue—10YR or 7.5YR
Value—6, 7, or 8 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—sandy loam or loam
Clay content—5 to 15 percent
Content of rock fragments—50 to 70 percent (0 to 25 percent cobbles, 35 to 60 percent pebbles)
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 8.4

2Bk horizon:
Hue—10YR or 7.5YR
Value—6 or 7 dry; 4 or 5 moist
Chroma—2, 3, or 4
Clay content—0 to 5 percent
Content of rock fragments—60 to 80 percent (0 to 30 percent cobbles, 40 to 70 percent pebbles)
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.4 to 9.0

Nivean Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Side slopes of hills and mountains
Parent material: Residuum derived from welded tuff bedrock
Slope range: 15 to 60 percent
Elevation range: 4,500 to 6,200 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 95 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Lithic Haplustolls

Typical Pedon

Nivean very cobbly loam, in an area of Nivean, very stony-Rock outcrop-Rubble land complex, 25 to 60 percent slopes, in rangeland, 1,600 feet west and 2,100 feet south of the northeast corner of sec. 19, T. 6 N., R. 6 W.

A1—0 to 3 inches; grayish brown (10YR 5/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; weak very fine and fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; 20 percent angular tuff cobbles and 15 percent angular tuff pebbles; neutral (pH 6.8); clear wavy boundary.
A2—3 to 7 inches; grayish brown (10YR 5/2) very gravelly loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and few coarse roots; 10 percent angular tuff cobbles and 30 percent angular tuff pebbles; neutral (pH 6.8); clear wavy boundary.
Bw—7 to 12 inches; light gray (10YR 7/2) very gravelly sandy loam, light brownish gray (10YR 6/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots and few medium roots; many medium pores; 5 percent angular tuff cobbles and 35 percent angular tuff pebbles; slightly alkaline (pH 7.4); clear wavy boundary.
Cr—12 to 16 inches; light gray (2.5Y 7/2), poorly consolidated welded tuff bedrock.
R—16 inches; light gray (5Y 7/1), fractured, hard welded tuff bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 10 inches
Content of volcanic glass: More than 30 percent in the coarse silt and sand fraction of one or more horizons
Depth to Cr horizon: 10 to 18 inches
Depth to R layer: 12 to 20 inches
Percent of surface covered by stones or boulders: 0.1 to 3.0 percent

A horizon:
Hue—10YR or 2.5Y
Value—3, 4, or 5 dry; 2 or 3 moist
Chroma—1, 2, or 3
Clay content—15 to 27 percent
Content of rock fragments—35 to 45 percent (10 to 20 percent cobbles and stones, 15 to 30 percent pebbles)
Reaction—pH 6.6 to 7.8

Bw horizon:
Hue—10YR or 2.5Y
Value—4, 5, 6, or 7 dry; 3, 4, 5, or 6 moist
Chroma—2 or 3
Texture—loam, sandy loam, or sandy clay loam
Clay content—18 to 27 percent
Content of rock fragments—35 to 60 percent (5 to 25 percent cobbles and stones, 30 to 35 percent pebbles)
Reaction—pH 6.1 to 7.8

Opitz Series

Depth class: Moderately deep (20 to 40 inches) to weathered granite bedrock (grus) and deep (40 to 60 inches) to hard granite bedrock
Drainage class: Well drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Ridges, plateaus, and side slopes of mountains
Parent material: Slope alluvium, colluvium, and residuum derived from granite

Slope range: 2 to 35 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Coarse-loamy, mixed, superactive Ustic Argicryolls

Typical Pedon

Opitz coarse sandy loam, in an area of Opitz, bouldery-Branham, very bouldery-Tuggle, very bouldery, complex, 8 to 35 percent slopes, in rangeland, 2,650 feet north and 975 feet west of the southeast corner of sec. 6, T. 3 N., R. 3 W.

A—0 to 10 inches; very dark grayish brown (10YR 3/2) coarse sandy loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; 10 percent granite pebbles; neutral (pH 6.6); clear wavy boundary.

Bt1—10 to 15 inches; brown (10YR 5/3) gravelly sandy clay loam, dark brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; common distinct clay films on faces of peds and bridging sand grains; 20 percent granite pebbles; neutral (pH 6.6); clear wavy boundary.

Bt2—15 to 22 inches; pale brown (10YR 6/3) gravelly coarse sandy loam, grayish brown (10YR 5/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; many very fine and fine pores; common faint clay films on faces of peds and bridging sand grains; 30 percent granite pebbles; neutral (pH 6.8); gradual wavy boundary.

BC—22 to 36 inches; grayish brown (10YR 5/2) very gravelly coarse sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common fine and very fine pores; 40 percent granite pebbles; neutral (pH 6.8); gradual irregular boundary.

Cr—36 to 57 inches; decomposed granite bedrock (grus) that crushes to very gravelly coarse sand.

R—57 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Thickness of the mollic epipedon: 7 to 13 inches
Depth to Bt horizon: 6 to 14 inches
Depth to Cr horizon: 20 to 40 inches
Depth to R layer: 40 to 60 inches
Percent of surface covered by stones or boulders: 0 to 0.1 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—3 or 4 dry; 2 or 3 moist
- Texture—coarse sandy loam or sandy loam
- Clay content—12 to 15 percent
- Content of rock fragments—5 to 15 percent pebbles
- Reaction—pH 6.1 to 7.3

Bt1 horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2, 3, or 4
- Texture—coarse sandy loam, sandy clay loam, or sandy loam
- Clay content—15 to 22 percent
- Content of rock fragments—10 to 35 percent pebbles
- Reaction—pH 6.1 to 7.3

Bt2 horizon:
- Hue—10YR or 2.5Y
- Value—6 or 7 dry; 5 or 6 moist
- Chroma—2, 3, or 4
- Texture—coarse sandy loam or sandy loam
- Clay content—15 to 18 percent
- Content of rock fragments—15 to 35 percent pebbles
- Reaction—pH 6.1 to 7.3

BC horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—coarse sandy loam, loamy coarse sand, or coarse sand
- Clay content—3 to 15 percent
- Content of rock fragments—15 to 50 percent pebbles
- Reaction—pH 6.1 to 7.3

Peeler Family

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, ridges, and side slopes of mountains
Parent material: Slope alluvium and residuum derived from granite
Slope range: 15 to 60 percent
Elevation range: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Taxonomic classification: Fine-loamy, mixed, superactive Eutric Glossocryalfs

Typical Pedon

Peeler bouldery sandy loam, in an area of Peeler-Rock outcrop complex, 15 to 60 percent slopes; in a forested area, 1,900 feet west and 600 feet north of the southeast corner of sec. 7, T. 9 N., R. 3 W.

Oi—2 inches to 0; forest litter of partially decomposed needles and twigs.
E—0 to 5 inches; light brownish gray (10YR 6/2) bouldery sandy loam, grayish brown (10YR 5/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common fine and very fine roots and few medium roots; many very fine pores; 10 percent boulders and 10 percent granite pebbles; slightly acid (pH 6.4); clear smooth boundary.
E/B—5 to 12 inches; 80 percent light brownish gray (10YR 6/2) sandy loam, grayish brown (10YR 5/2) moist (E part); 20 percent brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist (B part); moderate medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; many very fine pores; 10 percent granite pebbles; slightly acid (pH 6.3); gradual smooth boundary.
Bt/E—12 to 21 inches; 80 percent brown (10YR 5/3) sandy clay loam, brown (10YR 4/3) moist (Bt part); 20 percent light brownish gray (10YR 6/2) sandy loam, grayish brown (10YR 5/2) moist (E part); moderate medium subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; common fine and very fine roots and few medium roots; many very fine pores; many distinct clay films on faces of peds and bridging sand grains; 10 percent granite pebbles; slightly acid (pH 6.2); gradual smooth boundary.
Bt1—21 to 29 inches; yellowish brown (10YR 5/6) sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium and coarse roots; common very fine pores; common distinct yellowish brown (10YR 5/4) clay films on faces of peds and bridging sand grains; 5 percent granite pebbles; slightly acid (pH 6.1); gradual smooth boundary.
Bt2—29 to 45 inches; light olive brown (2.5Y 5/4) sandy loam, olive brown (2.5Y 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots and few medium and coarse roots; common very fine pores; few faint yellowish brown (10YR 5/4) clay films on faces of peds and bridging sand grains; 5 percent granite pebbles; neutral (pH 6.7); gradual wavy boundary.
C—45 to 60 inches; light brownish gray (2.5Y 6/2) gravelly sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose, nonsticky and nonplastic; few fine and very fine roots; 20 percent granite pebbles; neutral (pH 6.8).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches

E horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2 or 3
Clay content—5 to 15 percent
Content of rock fragments—15 to 35 percent (5 to 15 percent boulders or stones, 0 to 5 percent cobbles, 10 to 15 percent pebbles)
Reaction—pH 5.6 to 6.5

E/B and Bt/E horizons:
Hue—10YR or 2.5Y
Value—5, 6, 7, or 8 dry; 4, 5, 6, or 7 moist
Chroma—2, 3, 4, 5, or 6
Clay content—18 to 30 percent
Content of rock fragments—5 to 25 percent pebbles
Reaction—pH 5.6 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, 4, 5, or 6
Clay content—18 to 30 percent
Content of rock fragments—5 to 25 percent pebbles

Reaction—pH 5.6 to 7.3

C horizon:
Hue—2.5Y or 5Y
Value—4, 5, or 6 dry; 3 or 4 moist
Chroma—2 or 3
Clay content—0 to 10 percent
Reaction—pH 5.6 to 7.3

Pensore Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, knolls, ridges, strath terraces, and side slopes of hills
Parent material: Residuum derived from limestone
Slope range: 2 to 60 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Loamy-skeletal, carbonatic, frigid Lithic Calciustepts

Typical Pedon

Pensore very gravelly loam, in an area of Pensore-Rock outcrop-Roto complex, 2 to 25 percent slopes, in rangeland, 2,150 feet west and 700 feet south of the northeast corner of sec. 32, T. 4 N., R. 2 W.

A—0 to 7 inches; grayish brown (10YR 5/2) very gravelly loam, brown (10YR 4/3) moist; weak very fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; 5 percent angular cobbles and 35 percent angular pebbles; disseminated lime, common faint lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.
Bk—7 to 19 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; common very fine pores; 5 percent angular cobbles and 50 percent angular pebbles; disseminated lime, common fine and medium threads and masses of lime, many distinct lime casts on fragments; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.
R—19 inches; hard limestone bedrock.

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between a depth of 6 inches and the lithic contact
Depth to Bk horizon: 3 to 7 inches
Depth to bedrock: 10 to 20 inches
Percent of surface covered by stones or boulders: 0 to 0.1 percent

A horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 3, 4, or 5 moist
Chroma—2 or 3
Clay content—10 to 25 percent
Content of rock fragments—15 to 60 percent (0 to 5 percent stones and cobbles, 15 to 55 percent pebbles and channers)
Calcium carbonate equivalent—5 to 25 percent
Reaction—pH 7.9 to 8.4

Bk horizon:
Hue—10YR or 2.5Y
Value—7 or 8 dry; 6 or 7 moist
Chroma—2, 3, or 4
Clay content—10 to 25 percent
Content of rock fragments—35 to 60 percent (0 to 15 percent cobbles and stones, 35 to 55 percent pebbles and channers)
Calcium carbonate equivalent—40 to 60 percent (including coarse fragments less than 3/4 inch in size)
Reaction—pH 7.9 to 9.0

Perma Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat excessively drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, escarpments, ridges, and side slopes of hills
Parent material: Slope alluvium and colluvium derived from mixed rock sources
Slope range: 2 to 60 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Haplustolls

Typical Pedon

Perma cobbly loam, in an area of Perma, stony-

Whitlash, very stony, complex, 15 to 35 percent slopes, in rangeland, 2,590 feet east and 1,520 feet north of the southwest corner of sec. 28, T. 7 N., R. 4 W.

A1—0 to 7 inches; dark grayish brown (10YR 4/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 15 percent angular cobbles and 15 percent angular pebbles; neutral (pH 6.6); clear wavy boundary.

A2—7 to 13 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine pores; 10 percent angular cobbles and 45 percent rounded pebbles; neutral (pH 6.8); clear wavy boundary.

Bw1—13 to 28 inches; brown (10YR 5/3) very gravelly loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine pores; 15 percent angular cobbles and 35 percent angular pebbles; neutral (pH 7.0); gradual wavy boundary.

Bw2—28 to 44 inches; pale brown (10YR 6/3) very gravelly sandy loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine pores; 15 percent angular cobbles and 40 percent angular pebbles; slightly alkaline (pH 7.4); gradual wavy boundary.

BC—44 to 60 inches; very pale brown (10YR 7/3) extremely gravelly sandy loam, grayish brown (10YR 5/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; 20 percent angular cobbles and 50 percent angular pebbles; common faint lime coatings on undersides of fragments; slightly alkaline (pH 7.4).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Thickness of the mollic epipedon: 10 to 15 inches
Percent of surface covered by stones or boulders: 0.01 to 3.0 percent

A horizon:
- Value—4 or 5 dry; 2 or 3 moist
- Chroma—2 or 3
- Clay content—15 to 27 percent
- Content of rock fragments—15 to 60 percent (0 to 30 percent cobbles and stones, 10 to 50 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bw horizon:
- Hue—10YR or 7.5YR
- Value—4, 5, or 6 dry; 3, 4, or 5 moist
- Chroma—2, 3, or 4
- Texture—loam or sandy loam
- Clay content—10 to 20 percent
- Content of rock fragments—35 to 85 percent (0 to 50 percent cobbles and stones, 25 to 65 percent pebbles)
- Reaction—pH 6.1 to 7.8

BC horizon:
- Hue—10YR or 7.5YR
- Value—4, 6, or 7 dry; 3, 4, or 5 moist
- Chroma—2, 3, or 4
- Texture—loam or sandy loam
- Clay content—0 to 20 percent
- Content of rock fragments—60 to 85 percent (10 to 50 percent cobbles and stones, 50 to 65 percent pebbles)
- Calcium carbonate equivalent—0 to 10 percent
- Reaction—pH 7.4 to 8.4

Pieriver Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat poorly drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Flood plains, flood-plain steps, and drainageways
Parent material: Recent alluvium derived from mixed rock sources
Slope range: 0 to 2 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, calcareous, frigid Oxyaquic Ustifluvents

Typical Pedon

Pieriver loam, in an area of Cardwell-Pieriver complex, 0 to 2 percent slopes, in pasture, 420 feet east and 200 feet south of the northwest corner of sec. 9, T. 1 N., R. 3 W.

A—0 to 7 inches; grayish brown (10YR 5/2) loam with

few thin strata of loamy sand, dark grayish brown (10YR 4/2) moist; weak medium granular structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; disseminated lime; strongly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

C1—7 to 19 inches; light gray (10YR 5/1) loam, dark grayish brown (10YR 4/2) moist; moderate thin platy structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine and very fine pores; disseminated lime; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

C2—19 to 38 inches; grayish brown (10YR 6/1) loam, dark grayish brown (10YR 4/2) moist; few faint light gray (N 7/) redox depletions; weak thin platy structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; common fine pores; disseminated lime; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

C3—38 to 47 inches; pale brown (10YR 6/3) loamy fine sand, grayish brown (10YR 5/2) moist; few prominent yellowish red (5YR 4/6) redox concentrations; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine roots; disseminated lime; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

C4—47 to 60 inches; grayish brown (10YR 5/1) loam, dark grayish brown (10YR 4/2) moist; common prominent dark gray (N 4/) redox depletions; massive; hard, firm, slightly sticky and moderately plastic; disseminated lime; strongly effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to seasonal high water table: 24 to 42 inches

A horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 3 or 4 moist
- Chroma—2 or 3
- Texture—loam, silt loam, or sandy loam; thin strata of loamy sand in some pedons
- Clay content—18 to 27 percent
- Content of rock fragments—0 to 10 percent pebbles
- Calcium carbonate equivalent—5 to 10 percent
- Reaction—pH 7.4 to 8.4

C1, C2, and C4 horizons:
- Hue—10YR, 2.5Y, or 5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—1, 2, or 3
- Texture—loam, clay loam, or fine sandy loam; thin strata of loamy fine sand, fine sand, or sand and gravel in some pedons
- Clay content—18 to 30 percent
- Content of rock fragments—0 to 10 percent pebbles
- Calcium carbonate equivalent—5 to 10 percent
- Reaction—pH 7.4 to 8.4

C3 horizon:
- Hue—10YR or 2.5Y
- Value—6 or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—sandy loam or loamy fine sand
- Clay content—8 to 20 percent
- Content of rock fragments—0 to 15 percent pebbles
- Calcium carbonate equivalent—5 to 10 percent
- Reaction—pH 7.4 to 8.4

Placerton Series

Depth class: Moderately deep (20 to 40 inches) to weathered granite bedrock (grus) and deep (40 to 60 inches) to hard granite bedrock
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Ridges, divides, and side slopes of hills and mountains
Parent material: Local colluvium, slope alluvium, and residuum derived from granite
Slope range: 2 to 35 percent
Elevation range: 4,800 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Placerton gravelly sandy clay loam, in an area of Placerton-Farnuf-Connieo complex, 8 to 15 percent slopes, in rangeland, 1,000 feet south and 900 feet west of the northeast corner of sec. 5, T. 5 N., R. 4 W.

A—0 to 7 inches; grayish brown (10YR 5/2) gravelly sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure; soft, very friable, moderately

sticky and slightly plastic; many very fine and few fine roots; many very fine and fine pores and few medium pores; 20 percent granite pebbles; neutral (pH 6.6); clear smooth boundary.

Bt1—7 to 11 inches; brown (10YR 5/3) gravelly clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; many very fine and few fine roots; many very fine and few fine pores; many faint clay films on faces of peds; 30 percent granite pebbles; neutral (pH 6.8); clear smooth boundary.

Bt2—11 to 21 inches; brown (10YR 5/3) gravelly sandy clay loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; common very fine and few fine roots; many very fine and few fine pores; many faint clay films on faces of peds and bridging sand grains; 25 percent granite pebbles; neutral (pH 7.0); clear smooth boundary.

Bk—21 to 29 inches; very pale brown (10YR 7/3) gravelly sandy loam, light yellowish brown (10YR 6/4) moist; moderate medium and fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine roots; common very fine pores; 30 percent granite pebbles; disseminated lime, few fine masses of lime; strongly effervescent; moderately alkaline (pH 8.3); clear smooth boundary.

Cr—29 to 58 inches; grayish brown (2.5Y 5/2), decomposed granite bedrock (grus) that crushes to very gravelly coarse sand or loamy coarse sand.

R—58 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bt horizon: 6 to 16 inches
Depth to Bk horizon: 15 to 30 inches
Depth to Cr horizon: 20 to 40 inches
Depth to R layer: 40 to 60 inches

A horizon:
- Hue—10YR or 2.5Y
- Value—4 or 5 dry; 2 or 3 moist
- Chroma—2 or 3
- Texture—sandy loam or sandy clay loam
- Clay content—10 to 25 percent
- Content of rock fragments—5 to 25 percent pebbles
- Reaction—pH 6.1 to 7.3

Bt horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 3, 4, or 5 moist
- Chroma—3 or 4
- Texture—loam, sandy clay loam, or clay loam
- Clay content—20 to 30 percent
- Content of rock fragments—5 to 30 percent pebbles
- Reaction—pH 6.6 to 7.8

Bk horizon:
- Hue—10YR or 2.5Y
- Value—6 or 7 dry; 5 or 6 moist
- Chroma—2, 3, or 4
- Texture—coarse sandy loam, sandy loam, or sandy clay loam
- Clay content—10 to 25 percent
- Content of rock fragments—10 to 35 percent pebbles
- Calcium carbonate equivalent—5 to 15 percent
- Reaction—pH 7.9 to 8.4

Quaint Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Ridges, plateaus, and side slopes of hills
Parent material: Slope alluvium and residuum derived from hard, red shale bedrock
Slope range: 2 to 45 percent
Elevation range: 4,600 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 95 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Lithic Haplustepts

Typical Pedon

Quaint channery loam, in an area of Quaint-Rock outcrop-Redfist complex, 4 to 25 percent slopes, in rangeland, 300 feet north and 1,200 feet west of the southeast corner of sec. 13, T. 4 N., R. 2 W.

A—0 to 5 inches; weak red (2.5YR 4/2) channery loam, dusky red (2.5YR 3/2) moist; moderate medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine

and fine roots; 25 percent channers; slightly alkaline (pH 7.8); clear wavy boundary.
Bk1—5 to 11 inches; weak red (10R 5/3) very channery loam, dark reddish brown (2.5YR 3/4) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, nonsticky and nonplastic; many fine and very fine roots; common very fine and fine pores; 5 percent flagstones and 35 percent channers; disseminated lime, few faint lime coatings on fragments; strongly effervescent; moderately alkaline (pH 8.3); clear wavy boundary.
Bk2—11 to 14 inches; weak red (10R 5/3) very channery loam, dark reddish brown (2.5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine and fine pores; 5 percent flagstones and 55 percent channers; disseminated lime, common distinct lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.3); clear smooth boundary.
R—14 inches; weak, red (10R 5/3), fractured, hard shale.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact
Depth to Bk horizon: 3 to 7 inches
Depth to bedrock: 10 to 20 inches
Percent of surface covered by stones or boulders: 0 to 3 percent

A horizon:
Hue—2.5YR, 5YR, or 7.5YR
Value—4, 5, or 6 dry
Chroma—2 or 3
Clay content—18 to 27 percent
Content of rock fragments—15 to 35 percent (0 to 5 percent flagstones, 15 to 30 percent channers)
Reaction—pH 6.6 to 7.8

Bk horizon:
Hue—10R, 2.5YR, or 7.5YR
Value—5 or 6 dry; 3, 4, or 5 moist
Chroma—3 or 4
Clay content—18 to 27 percent
Content of rock fragments—35 to 60 percent (5 to 10 percent flagstones, 30 to 55 percent channers)
Calcium carbonate equivalent—3 to 10 percent
Reaction—pH 7.4 to 8.4

Quincreek Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, knolls, and side slopes of hills
Parent material: Slope alluvium and residuum derived from fractured, red shale bedrock
Slope range: 2 to 8 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 95 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Quincreek channery loam, 2 to 8 percent slopes, in rangeland, 400 feet south and 2,200 feet east of the northwest corner of sec. 12, T. 4 N., R. 2 W.

A—0 to 3 inches; brown (7.5YR 5/2) channery loam, dark brown (7.5YR 3/2) moist; moderate medium granular structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; 20 percent shale channers; neutral (pH 7.3); clear wavy boundary.
Bt—3 to 9 inches; dark brown (7.5YR 4/2) channery clay loam, dark brown (7.5YR 3/2) moist; strong medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and slightly plastic; many very fine and fine roots; common fine and very fine pores; common distinct brown (7.5YR 4/2) clay films on faces of peds; 20 percent shale channers; slightly alkaline (pH 7.4); gradual wavy boundary.
Bk1—9 to 19 inches; pinkish gray (7.5YR 6/2) very channery loam, brown (7.5YR 5/2) moist; moderate medium and coarse prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine pores; 40 percent shale channers; disseminated lime, common fine masses and threads of lime, common distinct lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.
Bk2—19 to 27 inches; brown (7.5YR 5/2) very channery loam, brown (7.5YR 4/2) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine

roots; common very fine pores; 55 percent shale channers; disseminated lime, common fine masses of lime, common faint lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.0); abrupt smooth boundary.
R—27 inches; reddish brown (5YR 4/3), hard, fractured shale.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 6 to 10 inches
Depth to Bt horizon: 3 to 6 inches
Depth to Bk horizon: 7 to 9 inches
Depth to bedrock: 20 to 40 inches

A horizon:
Hue—5YR, 7.5YR, or 10YR
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Clay content—18 to 27 percent
Content of rock fragments—5 to 20 percent channers
Reaction—pH 6.6 to 7.8

Bt horizon:
Hue—5YR or 7.5YR
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Texture—loam or clay loam
Clay content—25 to 35 percent
Content of rock fragments—15 to 35 percent channers
Reaction—pH 6.6 to 7.8

Bk1 horizon:
Hue—5YR or 7.5YR
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—loam or clay loam
Clay content—22 to 30 percent
Content of rock fragments—35 to 50 percent channers
Calcium carbonate equivalent—15 to 25 percent
Reaction—pH 7.9 to 8.4

Bk2 horizon:
Hue—5YR or 7.5YR
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Clay content—18 to 27 percent
Content of rock fragments—35 to 65 percent channers
Calcium carbonate equivalent—5 to 20 percent
Reaction—pH 7.9 to 8.4

Raghorn Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans and side slopes of hills
Parent material: Alluvium derived from granite
Slope range: 0 to 70 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Aridic Haplustalfs

Typical Pedon

Raghorn sandy loam, 4 to 8 percent slopes, in rangeland, 870 feet north and 1,280 feet east of the southwest corner of sec. 26, T. 2 N., R. 5 W.

A1—0 to 3 inches; grayish brown (10YR 5/2) sandy loam, dark brown (10YR 3/3) moist; moderate medium granular structure; slightly hard, friable, slightly sticky and nonplastic; many very fine and fine roots; slightly alkaline (pH 7.6); clear smooth boundary.
A2—3 to 7 inches; brown (10YR 5/3) sandy loam, dark yellowish brown (10YR 3/4) moist; moderate coarse subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many fine and very fine roots and few medium roots; slightly alkaline (pH 7.8); clear smooth boundary.
Bt—7 to 12 inches; brown (10YR 5/3) sandy clay loam, dark yellowish brown (10YR 3/4) moist; strong coarse prismatic structure parting to strong medium and coarse angular blocky; hard, firm, moderately sticky and moderately plastic; many fine and very fine roots; common fine and very fine tubular pores; common distinct brown (10YR 4/3) clay films on faces of peds; slightly alkaline (pH 7.6); gradual smooth boundary.
BC—12 to 20 inches; pale brown (10YR 6/3) sandy loam, dark yellowish brown (10YR 4/4) moist; moderate coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, nonsticky and nonplastic; many very fine and fine roots; slightly alkaline (pH 7.6); gradual smooth boundary.
2C1—20 to 44 inches; pale brown (10YR 6/3) loamy coarse sand, yellowish brown (10YR 5/4) moist; single grain; loose, nonsticky and nonplastic; few or common very fine roots; disseminated lime;

slightly effervescent; slightly alkaline (pH 7.6); clear smooth boundary.
3C2—44 to 60 inches; pale brown (10YR 6/3), stratified sandy loam and loam, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, slightly sticky and slightly plastic; slightly alkaline (pH 7.8).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 6 to 11 inches
Percent of surface covered by boulders: 0 to 0.1 percent

A horizon:
Chroma—2, 3, or 4
Clay content—10 to 20 percent
Content of rock fragments—0 to 25 percent (0 to 15 percent pebbles, 0 to 10 percent cobbles)
Reaction—pH 6.6 to 7.8

Bt horizon:
Chroma—3 or 4
Texture—sandy loam or sandy clay loam
Clay content—18 to 25 percent
Content of rock fragments—0 to 15 percent (0 to 15 percent pebbles, 0 to 3 percent cobbles)
Reaction—pH 6.6 to 7.8

BC horizon:
Chroma—3 or 4
Texture—fine sandy loam, coarse sandy loam, or sandy loam
Clay content—5 to 15 percent
Reaction—pH 7.4 to 8.4

C horizon:
Chroma—3 or 4
Texture—loamy coarse sand and stratified sandy loam and loam
Clay content—5 to 18 percent
Reaction—pH 7.4 to 8.4

Ratiopeak Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Alluvial fans and side slopes of mountains
Parent material: Slope alluvium and colluvium derived from hard, fine grained sandstone or fine grained igneous rock
Slope range: 1 to 15 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Ustic Argicryolls

Typical Pedon

Ratiopeak gravelly loam, in an area of Ratiopeak-Tiban gravelly loams, 4 to 15 percent slopes, bouldery, in rangeland, 1,650 feet south and 1,000 feet east of the northwest corner of sec. 3, T. 5 N., R. 2 W.

A1—0 to 3 inches; very dark grayish brown (10YR 3/2) gravelly loam, black (10YR 2/1) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine pores; 20 percent angular pebbles; slightly acid (pH 6.4); clear wavy boundary.
A2—3 to 10 inches; very dark grayish brown (10YR 3/2) gravelly loam, very dark brown (10YR 2/2) moist; strong medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine pores; 25 percent angular pebbles; neutral (pH 6.6); clear wavy boundary.
Bt1—10 to 15 inches; brown (10YR 4/3) very gravelly clay loam, dark brown (10YR 3/3) moist; strong medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores and few medium pores; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; 40 percent angular pebbles; neutral (pH 7.0); gradual wavy boundary.
Bt2—15 to 26 inches; pale brown (10YR 6/3) very gravelly clay loam, brown (10YR 5/3) moist; strong medium prismatic structure parting to moderate medium subangular blocky; hard, firm, moderately sticky and moderately plastic; many very fine and fine roots and few medium roots; many very fine and fine pores; common distinct grayish brown (10YR 5/2) clay films on faces of peds; 40 percent angular pebbles; neutral (pH 7.2); gradual wavy boundary.
Bt3—26 to 35 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 5/3) moist; moderate coarse prismatic structure; hard, firm, moderately sticky and moderately plastic; common very fine and fine roots; common very fine and fine pores and few medium pores; few distinct clay films on

faces of peds; 45 percent angular pebbles; slightly alkaline (pH 7.8); gradual smooth boundary.
Bk—35 to 60 inches; very pale brown (10YR 7/3) very gravelly loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine pores; 5 percent angular cobbles and 50 percent angular pebbles; disseminated lime, common fine masses and threads of lime, common distinct lime casts on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.3).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 10 to 15 inches
Depth to Bt horizon: 6 to 11 inches
Depth to Bk horizon: 25 to 40 inches
Percent of surface covered by stones/boulders: 0.01 to 0.1 percent

A horizon:
Hue—10YR, 7.5YR, or 2.5Y
Value—3 or 4 dry; 2 or 3 moist
Chroma—1 or 2
Clay content—18 to 27 percent
Content of rock fragments—15 to 35 percent (0 to 10 percent stones and cobbles, 15 to 25 percent pebbles)
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—7.5YR or 10YR
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—3, 4, 5, or 6
Texture—loam or clay loam
Clay content—25 to 35 percent
Content of rock fragments—35 to 60 percent (0 to 15 percent stones and cobbles, 35 to 45 percent pebbles)
Reaction—pH 6.1 to 7.8

Bk horizon:
Hue—7.5YR or 10YR
Value—6 or 7 dry; 5 or 6 moist
Chroma—3 or 4
Texture—loam or clay loam
Clay content—18 to 30 percent
Content of rock fragments—35 to 70 percent (0 to 20 percent stones and cobbles, 30 to 50 percent pebbles)
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.4 to 8.4

Raynesford Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, swales, and drainageways
Parent material: Slope alluvium and colluvium derived from mixed rock sources with a high percentage of limestone fragments
Slope range: 4 to 25 percent
Elevation range: 5,500 to 7,500 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Fine-loamy, carbonatic Calcic Haplocryolls

Typical Pedon

Raynesford silt loam, 4 to 15 percent slopes, in rangeland, 1,925 feet west and 2,175 feet north of the southeast corner of sec. 2, T. 5 N., R. 2 W.

A1—0 to 2 inches; very dark grayish brown (10YR 3/2) silt loam, black (10YR 2/1) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; 5 percent pebbles; slightly acid (pH 6.4); clear smooth boundary.
A2—2 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots and few medium roots; 5 percent pebbles; neutral (pH 6.6); clear wavy boundary.
Bw1—5 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, very dark brown (10YR 2/2) moist; strong medium prismatic structure parting to strong fine subangular blocky; many very fine and fine roots and few medium roots; many very fine and fine pores; neutral (pH 6.8); clear wavy boundary.
Bw2—10 to 15 inches; dark grayish brown (10YR 4/2) silt loam, very dark grayish brown (10YR 3/2) moist; strong coarse prismatic structure parting to strong medium subangular blocky; many very fine and fine roots and common medium roots; many very fine and fine pores; 10 percent pebbles; slightly alkaline (pH 7.6); clear wavy boundary.
Bk1—15 to 36 inches; pale brown (10YR 6/3) gravelly silt loam, brown (10YR 5/3) moist; moderate coarse subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium

and coarse roots; many very fine and fine pores; 25 percent pebbles; disseminated lime, common fine and medium threads and masses of lime, common faint lime coatings on undersides of fragments; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.

Bk2—36 to 60 inches; light gray (10YR 7/2) gravelly silt loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium roots; common fine and very fine pores; 20 percent pebbles; disseminated lime, common fine threads and masses of lime, common faint lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 12 to 16 inches
Depth to Bk horizon: 12 to 20 inches

A horizon:
- Hue—10YR or 2.5Y
- Value—3 or 4 dry; 2 or 3 moist
- Chroma—1 or 2
- Clay content—18 to 27 percent
- Content of rock fragments—0 to 10 percent pebbles
- Reaction—pH 6.1 to 7.3

Bw horizon:
- Hue—2.5Y, 10YR, or 7.5YR
- Value—3, 4, or 5 dry; 2 or 3 moist
- Chroma—1, 2, or 3
- Texture—silt loam or loam
- Clay content—15 to 27 percent
- Content of rock fragments—0 to 10 percent pebbles
- Reaction—pH 6.6 to 7.8

Bk horizon:
- Hue—2.5Y, 10YR, or 7.5YR
- Value—6, 7, or 8 dry; 5, 6, or 7 moist
- Chroma—2, 3, or 4
- Texture—silt loam or loam
- Clay content—10 to 27 percent
- Content of rock fragments—15 to 35 percent (0 to 5 percent cobbles, 15 to 30 percent pebbles)
- Calcium carbonate equivalent—40 to 50 percent
- Reaction—pH 7.9 to 8.4

Redfern Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, divides, and side slopes of mountains
Parent material: Residuum derived from hard, fine grained sandstone or fine grained igneous rock
Slope range: 15 to 70 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Lithic Haplocryalfs

Typical Pedon

Redfern very cobbly loam, in an area of Redfern, bouldery-Rock outcrop-Tigeron, very bouldery, complex, 25 to 60 percent slopes; in a forested area, 1,200 feet south and 1,800 feet east of the northwest corner of sec. 8, T. 5 N., R. 3 W.

Oi—1/2 inch to 0; partially decomposed needles, twigs, and leaves.

A—0 to 3 inches; light brownish gray (2.5Y 6/2) very cobbly loam, dark grayish brown (2.5Y 4/2) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium roots; many very fine and fine pores; 20 percent angular cobbles and 30 percent angular pebbles; neutral (pH 6.9); clear smooth boundary.

E—3 to 7 inches; light gray (10YR 7/2) extremely gravelly loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium roots; many very fine and fine pores; 20 percent angular cobbles and 40 percent angular pebbles; neutral (pH 6.8); clear smooth boundary.

Bt—7 to 18 inches; yellowish brown (10YR 5/4) extremely gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; common very fine and fine roots and few medium roots; common very fine and fine pores; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds and

bridging sand grains; 20 percent angular cobbles and 45 percent angular pebbles; moderately acid (pH 5.8); clear wavy boundary.
R—18 inches; very dark gray (5Y 3/1), hard, fine grained igneous bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)
Depth to Bt horizon: 3 to 13 inches
Depth to bedrock: 10 to 20 inches
Percent of surface covered by stones/boulders: 0.01 to 20 percent

A horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Clay content—15 to 27 percent
Content of rock fragments—35 to 60 percent (5 to 20 percent stones and cobbles, 30 to 40 percent pebbles)
Reaction—pH 6.1 to 7.3

E horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 5 or 6 moist
Chroma—2 or 3
Texture—loam or sandy loam
Clay content—15 to 25 percent
Content of rock fragments—35 to 65 percent (0 to 5 percent stones, 10 to 20 percent cobbles, 25 to 40 percent pebbles)
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—loam, clay loam, or sandy clay loam
Clay content—23 to 35 percent
Content of rock fragments—35 to 70 percent (0 to 15 percent stones, 15 to 30 percent cobbles, 20 to 45 percent pebbles)
Reaction—pH 5.6 to 7.3

Redfist Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, knolls, and side slopes of hills
Parent material: Local colluvium, slope alluvium, and residuum derived from red shale bedrock
Slope range: 2 to 35 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 95 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Calcic Haplustepts

Typical Pedon

Redfist channery loam, in an area of Redfist-Quaint channery loams, 2 to 8 percent slopes, in rangeland, 2,500 feet south and 150 feet west of the northeast corner of sec. 34, T. 4 N., R. 2 W.

A—0 to 4 inches; dark brown (7.5YR 4/2) channery loam, dark reddish brown (5YR 3/3) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots; 20 percent shale channers; disseminated lime; strongly effervescent; slightly alkaline (pH 7.8); clear wavy boundary.
Bk1—4 to 11 inches; light reddish brown (5YR 6/3) channery loam, reddish brown (5YR 4/4) moist; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots; many very fine pores; 30 percent shale channers; disseminated lime, common distinct lime coatings on undersides of fragments; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.
Bk2—11 to 29 inches; reddish gray (5YR 5/2) very channery loam, dark reddish brown (5YR 3/3) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine pores; 50 percent shale channers; disseminated lime, many distinct lime crusts on undersides of fragments; violently effervescent; moderately alkaline (pH 8.0); clear wavy boundary.
R—29 inches; dark reddish gray (5YR 4/2), fractured shale bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bk horizon: 4 to 7 inches

Depth to bedrock: 20 to 40 inches
Percent of surface covered by boulders: 0 to 0.1 percent

A horizon:
Hue—5YR, 7.5YR, or 10YR
Value—3 or 4
Chroma—2, 3, or 4
Clay content—15 to 25 percent
Content of rock fragments—15 to 25 percent channers
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 6.1 to 8.4

Bk1 horizon:
Hue—2.5YR or 5YR
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2, 3, 4, or 6
Clay content—15 to 25 percent
Content of rock fragments—10 to 40 percent channers
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.4 to 8.4

Bk2 horizon:
Hue—2.5YR, 5YR, or 7.5YR
Value—5, 6, or 7 dry; 3, 4, or 5 moist
Chroma—2, 3, 4, or 6
Clay content—15 to 25 percent
Content of rock fragments—35 to 60 percent channers
Calcium carbonate equivalent—15 to 25 percent
Reaction—pH 7.9 to 8.4

Releep Series

Depth class: Moderately deep (20 to 40 inches) to weathered granite bedrock (grus) and deep (40 to 60 inches) to hard granite bedrock
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Ridges and side slopes of mountains
Parent material: Local colluvium, slope alluvium, and residuum derived from granite
Slope range: 15 to 35 percent
Elevation range: 5,500 to 7,500 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Fine-loamy, mixed, superactive Ustic Glossocryalfs

Typical Pedon

Releep cobbly sandy loam, in an area of Releep, very bouldery-Kurrie, very bouldery-Rock outcrop complex, 15 to 35 percent slopes; in a forested area, 2,100 feet south and 2,600 feet west of the northeast corner of sec. 18, T. 9 N., R. 3 W.

Oi—2 inches to 0; partially decomposed needles, twigs, and leaves.
A—0 to 4 inches; brown (10YR 5/3) cobbly sandy loam, dark brown (10YR 3/3) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine and common fine roots; many very fine and fine pores; 15 percent cobbles and 15 percent granite pebbles; slightly acid (pH 6.4); clear smooth boundary.
E—4 to 11 inches; light gray (2.5Y 7/2) cobbly sandy loam, grayish brown (2.5Y 5/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine, common fine, and few medium roots; many very fine and fine pores; 15 percent cobbles and 15 percent granite pebbles; slightly acid (pH 6.2); clear wavy boundary.
Bt/E—11 to 16 inches; 70 percent light yellowish brown (2.5Y 6/4) cobbly sandy clay loam, light olive brown (2.5Y 5/4) moist (Bt part); 30 percent light gray (2.5Y 7/2) cobbly coarse sandy loam, grayish brown (2.5Y 5/2) moist (E part); weak medium and fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, common fine, and few medium roots; many very fine and few fine pores; many faint clay films bridging sand grains in the Bt part; 15 percent cobbles and 5 percent granite pebbles; neutral (pH 6.6); clear wavy boundary.
Bt—16 to 29 inches; light yellowish brown (2.5Y 6/4) cobbly sandy clay loam, light olive brown (2.5Y 5/4) moist; moderate medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; many very fine roots and few fine and medium roots; many very fine and fine pores; many faint clay films bridging sand grains; 15 percent cobbles and 5 percent granite pebbles; slightly acid (pH 6.5); clear wavy boundary.
BC—29 to 38 inches; light brownish gray (2.5Y 6/2) gravelly sandy loam, grayish brown (2.5Y 5/2) moist; weak coarse subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; few

very fine and fine roots; common very fine and few fine pores; 20 percent granite pebbles; neutral (pH 6.8); clear wavy boundary.
Cr—38 to 46 inches; grayish brown (2.5Y 5/2), decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand.
R—46 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 8 to 20 inches
Depth to Cr horizon: 20 to 40 inches
Depth to R layer: 40 to 60 inches
Percent of surface covered by stones/boulders: 0.1 to 3.0 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2, 3, or 4
Clay content—10 to 20 percent
Content of rock fragments—15 to 35 percent (0 to 5 percent stones, 10 to 15 percent cobbles, 5 to 15 percent pebbles)
Reaction—pH 6.1 to 7.3

E horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 5 or 6 moist
Chroma—1, 2, or 3
Texture—coarse sandy loam or sandy loam
Clay content—10 to 20 percent
Content of rock fragments—10 to 35 percent (0 to 5 percent stones, 5 to 15 percent cobbles, 5 to 15 percent pebbles)
Reaction—pH 6.1 to 7.3

Bt/E horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry, 4 or 5 moist (Bt part); 6 or 7 dry, 5 or 6 moist (E part)
Chroma—2, 3, or 4 (Bt part); 1, 2, or 3 (E part)
Texture (mixed)—coarse sandy loam or sandy clay loam
Clay content—18 to 25 percent
Content of rock fragments—10 to 35 percent (5 to 20 percent cobbles, 5 to 15 percent pebbles)
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—sandy clay loam or clay loam
Clay content—20 to 30 percent
Content of rock fragments—10 to 35 percent (5 to 20 percent cobbles, 5 to 15 percent pebbles)
Reaction—pH 6.1 to 7.3

BC horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—coarse sandy loam or sandy loam
Clay content—10 to 20 percent
Content of rock fragments—10 to 35 percent (0 to 5 percent cobbles, 10 to 25 percent pebbles, mostly less than 7 mm in diameter)
Reaction—pH 6.1 to 7.3

Rencot Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, strath terraces, and side slopes of hills
Parent material: Residuum derived from hard, fine grained sandstone or igneous rock
Slope range: 2 to 70 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Lithic Calciustepts

Typical Pedon

Rencot gravelly loam, in an area of Rencot-Rock outcrop-Rencot, stony, complex, 8 to 25 percent slopes, in rangeland, 1,400 feet east and 400 feet north of the southwest corner of sec. 15, T. 4 N., R. 2 W.

A—0 to 4 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate medium granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots and few medium roots; 5 percent angular cobbles and 25 percent angular pebbles; slightly alkaline (pH 7.4); clear smooth boundary.
Bk1—4 to 10 inches; light yellowish brown (10YR 6/4) very gravelly loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and common medium roots; many very fine and fine

pores; 10 percent angular cobbles and 35 percent angular pebbles; disseminated lime, common fine and medium threads and masses of lime, common faint lime coatings on undersides of fragments; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Bk2—10 to 19 inches; light yellowish brown (10YR 6/4) extremely gravelly sandy loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots matted between fragments; 20 percent angular cobbles and 50 percent angular pebbles; disseminated lime, many distinct lime coatings on fragments; violently effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

R—19 inches; fractured, hard, fine grained sandstone bedrock.

Range in Characteristics

Soil temperature: 42 to 46 degrees F

Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)

Depth to Bk horizon: 3 to 8 inches

Depth to bedrock: 10 to 20 inches

Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:

- Hue—7.5YR, 10YR, or 2.5Y
- Value—4, 5, or 6 dry; 3, 4, or 5 moist
- Chroma—2 or 3
- Clay content—15 to 27 percent
- Content of rock fragments—15 to 60 percent (0 to 30 percent cobbles and stones, 15 to 50 percent pebbles)
- Calcium carbonate equivalent—0 to 10 percent
- Reaction—pH 7.4 to 8.4

Bk horizon:

- Hue—7.5YR, 10YR, or 2.5Y
- Value—6, 7, or 8 dry; 5, 6, or 7 moist
- Chroma—2, 3, or 4
- Texture—loam or sandy loam
- Clay content—15 to 27 percent
- Content of rock fragments—35 to 70 percent (0 to 30 percent cobbles and stones, 35 to 60 percent pebbles)
- Calcium carbonate equivalent—15 to 40 percent
- Reaction—pH 7.9 to 9.0

Repkie Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of hills and mountains
Parent material: Colluvium derived mainly from fine grained igneous rocks and granite
Slope range: 25 to 60 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 90 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Haplustepts

Typical Pedon

Repkie very gravelly coarse sandy loam, in an area of Repkie, very stony-Yreka, stony-Skyview, very bouldery, complex, 25 to 60 percent slopes; in a forested area, 900 feet south and 1,100 feet west of the northeast corner of sec. 3, T. 8 N., R. 4 W.

Oi—1 inch to 0; partially decomposed needles, twigs, and leaves.

A—0 to 7 inches; grayish brown (10YR 5/2) very gravelly coarse sandy loam, dark grayish brown (10YR 4/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine roots and few fine and medium roots; many very fine and few fine pores; 45 percent pebbles; neutral (pH 7.0); clear wavy boundary.

E/Bw—7 to 18 inches; 70 percent very pale brown (10YR 7/3) very cobbly coarse sandy loam, brown (10YR 5/3) moist (E part); 30 percent brown (10YR 5/3) very cobbly coarse sandy loam, brown (10YR 4/3) moist (Bw part); weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine roots and few fine and medium roots; many very fine and few fine pores; 20 percent cobbles and 35 percent pebbles; neutral (pH 6.7); clear wavy boundary.

Bw—18 to 42 inches; brown (10YR 5/3) very gravelly coarse sandy loam, brown (10YR 4/3) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine roots and few fine and medium roots;

common very fine and few fine pores; 15 percent cobbles and 40 percent pebbles; neutral (pH 6.6); clear wavy boundary.

BC—42 to 60 inches; pale brown (10YR 6/3) very gravelly coarse sandy loam, grayish brown (10YR 5/2) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine and fine pores; 10 percent cobbles and 40 percent pebbles; neutral (pH 6.6).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Percent of surface covered by stones: 0.1 to 3.0 percent

A horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2, 3, or 4
Clay content—10 to 18 percent
Content of rock fragments—35 to 60 percent (0 to 5 percent stones, 0 to 10 percent cobbles, 35 to 45 percent pebbles)
Reaction—pH 6.1 to 7.3

E/Bw horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry, 5 or 6 moist (E part); 5 or 6 dry, 4 or 5 moist (Bw part)
Chroma—1, 2, or 3 (E part); 2, 3, or 4 (Bw part)
Texture—coarse sandy loam or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—35 to 60 percent (0 to 5 percent stones, 10 to 20 percent cobbles, 25 to 35 percent pebbles)
Reaction—pH 6.1 to 7.3

Bw horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—coarse sandy loam or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—35 to 60 percent (10 to 20 percent cobbles, 25 to 40 percent pebbles)
Reaction—pH 6.1 to 7.3

BC horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—coarse sandy loam or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—35 to 60 percent (5 to 10 percent cobbles, 30 to 50 percent pebbles)
Reaction—pH 6.1 to 7.3

Riverrun Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Moderately well drained
Permeability: Rapid (6.0 to 20.0 inches per hour)
Landform: Flood plains, flood-plain steps, and drainageways
Parent material: Recent alluvium derived from mixed rock sources
Slope range: 0 to 2 percent
Elevation range: 3,800 to 5,500 feet
Annual precipitation: 10 to 16 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 80 to 115 days

Taxonomic classification: Sandy-skeletal, mixed, frigid Oxyaquic Ustifluvents

Typical Pedon

Riverrun gravelly sandy loam, in an area of Cardwell-Riverrun-Pieriver complex, 0 to 2 percent slopes, in rangeland, 2,100 feet north and 1,150 feet west of the southeast corner of sec. 2, T. 1 N., R. 4 W.

A—0 to 4 inches; dark grayish brown (10YR 4/2) gravelly sandy loam, very dark brown (10YR 2/2) moist; weak medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and common fine roots; 15 percent rounded pebbles; neutral (pH 6.8); abrupt smooth boundary.

C1—4 to 9 inches; light brownish gray (10YR 6/2) gravelly loamy sand, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; common very fine and few fine roots; 20 percent rounded pebbles; neutral (pH 7.2); clear smooth boundary.

C2—9 to 57 inches; light brownish gray (10YR 6/2) very gravelly loamy coarse sand, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; few very fine and fine roots; 50 percent rounded pebbles; neutral (pH 7.2); gradual wavy boundary.

C3—57 to 60 inches; light brownish gray (2.5Y 6/2) loamy sand, dark grayish brown (2.5Y 4/2) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; slightly alkaline (pH 7.8).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 12 and 36 inches
Depth to the water table: 42 to 60 inches for extended periods during late spring or early summer
Note: A saline phase is recognized.

A horizon:
- Hue—10YR or 2.5Y
- Value—4, 5, or 6 dry; 2, 3, 4, or 5 moist
- Chroma—2 or 3
- Texture—loam, sandy loam, or fine sandy loam
- Clay content—6 to 26 percent
- Content of rock fragments—0 to 50 percent (0 to 10 percent stones and cobbles, 0 to 25 percent pebbles)
- Electrical conductivity—4 to 16 mmhos/cm (saline phase)
- Sodium adsorption ratio—0 to 4 (saline phase)
- Reaction—pH 6.6 to 7.8; pH 6.6 to 7.8 in the saline phase

C1 and C3 horizons:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4 or 5 moist
- Chroma—2 or 3
- Texture—sand, loamy sand, loamy coarse sand, or coarse sand
- Clay content—2 to 10 percent
- Content of rock fragments—0 to 35 percent (0 to 10 percent stones and cobbles, 0 to 35 percent pebbles)
- Electrical conductivity—2 to 16 mmhos/cm (saline phase)
- Sodium adsorption ratio—0 to 4 (saline phase)
- Reaction—pH 6.6 to 8.4; pH 6.6 to 8.4 in the saline phase

C2 horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4 or 5 moist
- Chroma—2 or 3
- Texture—sand, loamy sand, loamy coarse sand, or coarse sand
- Clay content—2 to 10 percent
- Content of rock fragments—35 to 80 percent (0 to 20 percent stones and cobbles, 35 to 70 percent pebbles)
- Electrical conductivity—2 to 8 mmhos/cm (saline phase)
- Sodium adsorption ratio—0 to 4 (saline phase)
- Reaction—pH 6.6 to 8.4; pH 6.6 to 8.4 in the saline phase

Rivra Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately rapid (2 to 6 inches per hour) to a depth of 6 inches and rapid (6 to 20 inches per hour) below this depth
Landform: Flood plains, flood-plain steps, and drainageways
Parent material: Alluvium
Slope range: 0 to 2 percent
Elevation range: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Taxonomic classification: Sandy-skeletal, mixed, frigid Aridic Ustifluvents

Typical Pedon

Rivra very gravelly loam, in an area of Ryell-Rivra complex, 0 to 3 percent slopes, in rangeland, 1,600 feet south and 2,200 feet west of the northeast corner of sec. 1, T. 21 N., R. 7 W., Lewis and Clark County, Montana:

Ap—0 to 6 inches; light brownish gray (10YR 6/2) very gravelly loam, dark brown (10YR 4/3) moist; weak very thin platy structure parting to weak very fine granular; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; 25 percent pebbles and 10 percent cobbles; disseminated lime; strongly effervescent; slightly alkaline; clear smooth boundary.

C1—6 to 20 inches; light brownish gray (10YR 6/2) extremely gravelly loamy sand, dark brown (10YR 4/3) moist; single grain; loose, slightly sticky and nonplastic; common very fine roots and few fine and medium roots; 50 percent pebbles and 20 percent cobbles; disseminated lime; strongly effervescent; moderately alkaline; gradual smooth boundary.

C2—20 to 60 inches; light brownish gray (10YR 6/2) extremely gravelly sand, dark brown (10YR 4/3) moist; single grain; loose; few very fine roots in the upper part; 55 percent pebbles and 15 percent cobbles; disseminated lime; strongly effervescent; moderately alkaline.

Range in Characteristics

Soil temperature: 42 to 47 degrees F
Moisture control section: Between the depths of 12 and 35 inches; dry in all parts between $^{4}/_{10}$ and $^{5}/_{10}$ of the cumulative days per year when the soil temperature at a depth of 20 inches is 41 degrees F or higher

Water table: At the surface to 3.5 feet below the surface at some time during the months of April, May, June, or July

Ap horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2 or 3
Clay content—5 to 15 percent
Content of rock fragments—35 to 60 percent (0 to 10 percent stones and cobbles, 15 to 50 percent pebbles)
Calcium carbonate equivalent—1 to 5 percent
Reaction—pH 7.4 to 8.4

C1 and C2 horizons:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2 or 3
Texture—sand or loamy sand that consists of stratification of these and some finer sands
Clay content—0 to 5 percent
Content of rock fragments—55 to 80 percent (10 to 20 percent stones and cobbles, 45 to 70 percent pebbles)
Calcium carbonate equivalent—5 to 10 percent
Reaction—pH 7.4 to 8.4

Roegulch Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of hills
Parent material: Slope alluvium and residuum derived from granite
Slope range: 8 to 60 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Lithic Haplustepts

Typical Pedon

Roegulch cobbly sandy clay loam, in an area of Skyview, very bouldery-Rock outcrop-Roegulch, very bouldery, complex, 8 to 35 percent slopes; in a forested area, 2,100 feet south and 500 feet west of the northeast corner of sec. 28, T. 9 N., R. 2 W.

Oi—2 inches to 0; partially decomposed needles, twigs, and leaves.

A—0 to 4 inches; dark grayish brown (10YR 4/2) cobbly sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine and fine pores and few medium pores; 20 percent cobbles and 10 percent granite pebbles; neutral (pH 7.0); clear smooth boundary.
Bw—4 to 16 inches; pale brown (10YR 6/3) very cobbly sandy clay loam, brown (10YR 5/3) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, common fine and medium, and few coarse roots; many very fine and few fine pores; 10 percent stones, 20 percent cobbles, and 20 percent granite pebbles; slightly acid (pH 6.2); clear smooth boundary.
Cr—16 to 19 inches; light brownish gray (2.5Y 6/2), decomposed granite bedrock (grus) that crushes to very gravelly coarse sand.
R—19 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between a depth of 6 inches and the lithic contact
Depth to Cr horizon: 10 to 18 inches
Depth to R layer: 12 to 20 inches
Percent of surface covered by stones/boulders: 0.01 to 20 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Texture—loam or sandy clay loam
Clay content—10 to 25 percent
Content of rock fragments—20 to 60 percent (10 to 20 percent cobbles and stones, 10 to 40 percent pebbles)
Reaction—pH 6.1 to 7.3

Bw horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—coarse sandy loam, sandy loam, or sandy clay loam
Clay content—10 to 25 percent
Content of rock fragments—35 to 70 percent (0 to 10 percent stones, 15 to 25 percent cobbles, 20 to 35 percent pebbles)
Reaction—pH 6.1 to 7.3

Rothiemay Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Alluvial fans, knolls, and stream terraces
Parent material: Alluvium
Slope range: 2 to 8 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Aridic Calciustolls

Typical Pedon

Rothiemay very gravelly loam, 2 to 8 percent slopes, in cropland, 1,200 feet south and 2,600 feet east of the northwest corner of sec. 11, T. 9 N., R. 2 W.

Ap—0 to 6 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; strong medium and coarse subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many very fine roots; 5 percent rounded cobbles and 35 percent rounded pebbles; slightly alkaline (pH 7.6); clear smooth boundary.

Bk1—6 to 21 inches; white (10YR 8/2) loam, pale brown (10YR 6/3) moist; moderate medium and coarse prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine pores; 10 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, common faint lime coatings on undersides of fragments; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Bk2—21 to 32 inches; very pale brown (10YR 8/4) gravelly loam, light yellowish brown (10YR 6/4) moist; weak medium and coarse subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine pores; 5 percent rounded cobbles and 15 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, common distinct lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

Bk3—32 to 60 inches; light yellowish brown (10YR 6/4) gravelly loam, brown (10YR 5/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; few very fine roots; common very fine pores; 10 percent rounded cobbles and 20 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, common distinct lime casts on undersides of fragments; violently effervescent; moderately alkaline (pH 8.2).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 9 inches
Depth to Bk horizon: 6 to 7 inches

Ap horizon:
- Hue—10YR or 2.5Y
- Value—4 or 5 dry; 2, 3, or 4 moist
- Chroma—2 or 3
- Clay content—15 to 27 percent
- Content of rock fragments—10 to 45 percent (0 to 5 percent cobbles, 10 to 40 percent pebbles)
- Calcium carbonate equivalent—5 to 10 percent
- Reaction—pH 7.4 to 8.4
- Note—calcareous when mixed to a depth of 7 inches

Bk horizon:
- Hue—10YR or 2.5Y
- Value—6, 7, or 8 dry; 5, 6, or 7 moist
- Chroma—2, 3, or 4
- Texture—clay loam or loam
- Clay content—18 to 35 percent
- Content of rock fragments—5 to 35 percent (0 to 10 percent cobbles, 5 to 20 percent pebbles)
- Calcium carbonate equivalent—15 to 40 percent
- Reaction—pH 7.9 to 9.0

Roto Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of hills
Parent material: Slope alluvium and residuum derived from limestone
Slope range: 2 to 60 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Loamy-skeletal, carbonatic, frigid Aridic Calciustepts

Typical Pedon

Roto very channery loam, in an area of Roto-Pensore-Crago complex, 35 to 60 percent slopes, stony, in rangeland, 900 feet south and 1,750 feet east of the northwest corner of sec. 36, T. 2 N., R. 1 W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) very channery loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; 35 percent channers and 5 percent flagstones; disseminated lime, common faint lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.0); clear smooth boundary.

Bk1—3 to 8 inches; pale brown (10YR 6/3) very channery loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine pores; 45 percent channers and 5 percent flagstones; disseminated lime, common fine seams and masses of segregated white lime, many distinct white lime casts on undersides of fragments; violently effervescent; moderately alkaline (pH 8.2); gradual smooth boundary.

Bk2—8 to 18 inches; white (10YR 8/2) very channery loam, light gray (10YR 7/2) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine pores; 45 percent channers and 10 percent flagstones; disseminated lime, common fine seams and masses of segregated white lime, continuous distinct white lime casts on undersides of fragments; violently effervescent; moderately alkaline (pH 8.4); gradual smooth boundary.

Bk3—18 to 30 inches; light gray (10YR 7/2) very channery loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots; many very fine pores; 50 percent channers and 10 percent flagstones; disseminated lime, common fine seams and masses of segregated white lime, continuous distinct white lime casts on fragments; violently effervescent; moderately alkaline (pH 8.4); abrupt wavy boundary.

R—30 inches; light gray (10YR 7/1), hard limestone.

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 6 and 18 inches
Depth to Bk horizon: 2 to 5 inches
Depth to bedrock: 20 to 40 inches
Percent of surface covered by stones/boulders: 0 to 0.1 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—4, 5, or 6 dry; 3 or 4 moist
- Chroma—1, 2, or 3
- Clay content—10 to 27 percent
- Content of rock fragments—15 to 60 percent (0 to 10 percent cobbles and stones, 15 to 50 percent pebbles)
- Calcium carbonate equivalent—10 to 25 percent
- Reaction—pH 7.9 to 8.4

Bk horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, 7, or 8 dry; 4, 5, 6, or 7 moist
- Chroma—2, 3, or 4
- Clay content—10 to 25 percent
- Content of rock fragments—35 to 65 percent (5 to 10 percent cobbles, 30 to 55 percent pebbles)
- Calcium carbonate equivalent—40 to 60 percent (including rock fragments less than 20 mm in diameter)
- Reaction—pH 7.9 to 9.0

Rubick Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Ridges and side slopes of mountains
Parent material: Slope alluvium derived from granite
Slope range: 35 to 60 percent
Elevation range: 5,500 to 8,000 feet
Annual precipitation: 15 to 30 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 30 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Ustic Eutrocryepts

Typical Pedon

Rubick cobbly coarse sandy loam, in an area of Rubick, very stony-Rock outcrop complex, 35 to 60 percent slopes; in a forested area, 2,400 feet south and 2,000 feet west of the northeast corner of sec. 20, T. 7 N., R. 3 W.

Oi—2 inches to 0; forest litter of partially decomposed needles and twigs.

E1—0 to 3 inches; light brownish gray (10YR 6/2) cobbly coarse sandy loam, brown (10YR 4/3) moist; moderate very fine granular structure; slightly hard, very friable, nonsticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; 5 percent stones, 10 percent cobbles, and 10 percent pebbles; slightly acid (pH 6.4); abrupt wavy boundary.

E2—3 to 8 inches; light brownish gray (10YR 6/2) very cobbly coarse sandy loam, brown (10YR 5/3) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots and common medium and coarse roots; many very fine, fine, and medium pores; 5 percent stones, 20 percent cobbles, and 15 percent pebbles; neutral (pH 7.0); clear wavy boundary.

Bw—8 to 27 inches; pale brown (10YR 6/3) very stony coarse sandy loam, brown (10YR 5/3) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots and common medium and coarse roots; many very fine, fine, and medium pores; 20 percent stones, 10 percent cobbles, and 20 percent pebbles; neutral (pH 7.2); gradual wavy boundary.

BC—27 to 60 inches; light gray (10YR 7/2) extremely stony loamy coarse sand, pale brown (10YR 6/3) moist; single grain; loose, nonsticky and nonplastic; few fine, medium, and coarse roots; 30 percent stones, 15 percent cobbles, and 25 percent pebbles; neutral (pH 7.0).

Range in Characteristics

Soil temperature: 36 to 42 degrees F

Moisture control section: Between the depths of 8 and 24 inches

Percent of surface covered by stones: 0.01 to 3.0 percent

E horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2 or 3
- Texture—sandy loam or coarse sandy loam
- Clay content—8 to 20 percent
- Content of rock fragments—15 to 50 percent (5 to 25 percent cobbles and stones, 10 to 25 percent pebbles)
- Reaction—pH 5.6 to 7.3

Bw horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2 or 3
- Texture—coarse sandy loam or sandy loam
- Clay content—8 to 18 percent
- Content of rock fragments—35 to 60 percent (20 to 35 percent cobbles and stones, 15 to 25 percent pebbles)
- Reaction—pH 5.6 to 7.3

BC horizon:
- Hue—10YR or 2.5Y
- Value—6 or 7 dry; 5 or 6 moist
- Chroma—2 or 3
- Texture—sandy loam, coarse sandy loam, loamy coarse sand, or loamy sand
- Clay content—5 to 15 percent
- Content of rock fragments—35 to 70 percent (25 to 45 percent cobbles and stones, 15 to 25 percent pebbles)
- Reaction—pH 5.6 to 7.3

Ryell Series

Depth class: Very deep (greater than 60 inches)

Drainage class: Well drained

Permeability: Moderate (0.6 inch to 2.0 inches per hour) above the 2C horizon and rapid (6.0 to 20.0 inches per hour) in the 2C horizon

Landform: Flood plains, flood-plain steps, and drainageways

Parent material: Recent alluvium derived from mixed rock sources

Slope range: 0 to 2 percent

Elevation range: 3,500 to 5,000 feet

Annual precipitation: 10 to 14 inches

Annual air temperature: 40 to 44 degrees F

Frost-free period: 90 to 120 days

Taxonomic classification: Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, calcareous, frigid Aridic Ustifluvents

Typical Pedon

Ryell loam, in an area of Ryell-Riverrun complex, 0 to 2 percent slopes, in rangeland, 700 feet south and 2,520 feet west of the northeast corner of sec. 4, T. 1 N., R. 3 W.

A—0 to 2 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; moderate very fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; 5 percent rounded pebbles; slightly effervescent; slightly alkaline (pH 7.4); clear smooth boundary.

C1—2 to 10 inches; brown (10YR 5/3) loam with thin strata of fine sandy loam and silt loam, brown

(10YR 4/3) moist; weak coarse prismatic structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots and few medium roots; common fine pores; 5 percent rounded pebbles; disseminated lime; slightly effervescent; slightly alkaline (pH 7.8); clear wavy boundary.

C2—10 to 28 inches; pale brown (10YR 6/3) sandy loam with thin strata of loam and silt loam, grayish brown (10YR 5/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine pores; 5 percent rounded pebbles; disseminated lime, common faint lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.3); gradual wavy boundary.

2C3—28 to 60 inches; very pale brown (10YR 7/3) very gravelly loamy sand with strata of sandy loam and loam, pale brown (10YR 6/3) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 5 percent rounded cobbles and 40 percent rounded pebbles; disseminated lime, common faint lime coatings on fragments in the upper part; slightly effervescent; moderately alkaline (pH 8.2).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Depth to 2C horizon: 20 to 40 inches
Depth to the water table: Dominantly more than 60 inches; 42 to 60 inches for brief periods during spring and early summer

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 2 or 3 moist
Chroma—2 or 3
Texture—loam or sandy loam
Clay content—10 to 27 percent
Content of rock fragments—0 to 15 percent pebbles
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 6.6 to 8.4

C horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—loam or sandy loam with thin strata of clay loam, silty clay loam, silt loam, fine sandy loam, or very fine sandy loam
Clay content—10 to 18 percent
Content of rock fragments—0 to 15 percent pebbles
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.4 to 8.4

2C horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—loamy sand or sand with strata of sandy loam, fine sandy loam, loam, or very fine sandy loam
Clay content—0 to 10 percent
Content of rock fragments—35 to 75 percent (0 to 15 percent cobbles, 35 to 60 percent pebbles)
Calcium carbonate equivalent—0 to 10 percent
Reaction—pH 7.4 to 8.4

Sappington Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, knolls, plains, and side slopes of hills
Parent material: Alluvium
Slope range: 0 to 15 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Coarse-loamy, mixed, superactive, frigid Calcidic Argiustolls

Typical Pedon

Sappington clay loam, in an area of Sappington-Amesha complex, 2 to 8 percent slopes, in cropland, 2,350 feet south and 1,300 feet east of the northwest corner of sec. 33, T. 3 N., R. 2 W.

Ap—0 to 4 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots; 3 percent rounded pebbles; neutral (pH 7.0); abrupt smooth boundary.

Bt—4 to 8 inches; brown (10YR 5/3) clay loam, brown (10YR 3/3) moist; moderate medium prismatic structure; hard, friable, moderately sticky and moderately plastic; common very fine and fine roots; many very fine pores; continuous faint clay

films on faces of peds; 3 percent rounded pebbles; slightly effervescent; slightly alkaline (pH 7.8); clear smooth boundary.
Bk1—8 to 20 inches; pale brown (10YR 6/3) loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine pores; 1 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, common faint lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.3); clear smooth boundary.
Bk2—20 to 28 inches; very pale brown (10YR 7/3) loam, pale brown (10YR 6/3) moist; weak coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine pores; 1 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, many distinct lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.3); gradual smooth boundary.
Bk3—28 to 60 inches; light yellowish brown (10YR 6/4) fine sandy loam, yellowish brown (10YR 5/4) moist; weak coarse angular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common fine and very fine roots; common very fine and fine pores; 5 percent rounded pebbles; disseminated lime, few fine masses of lime, common distinct lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Thickness of the mollic epipedon: 7 to 9 inches
Depth to Bk horizon: 6 to 10 inches
Percent of surface covered by stones: 0 to 0.1 percent

Ap horizon:
Hue—2.5Y or 10YR
Value—4 or 5 dry
Chroma—2 or 3
Texture—loam or clay loam
Clay content—15 to 35 percent
Content of rock fragments—0 to 35 percent (0 to 10 percent cobbles, 0 to 25 percent pebbles)
Calcium carbonate equivalent—0 to 3 percent
Reaction—pH 6.6 to 7.8

Bt horizon:
Hue—2.5Y or 10YR
Value—4 or 5 dry; 3 or 4 moist
Chroma—3 or 4
Clay content—27 to 35 percent
Content of rock fragments—0 to 25 percent pebbles
Calcium carbonate equivalent—0 to 10 percent
Reaction—pH 6.6 to 7.8

Bk horizon:
Hue—2.5Y or 10YR
Value—5, 6, 7, or 8 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—loam or sandy loam
Clay content—10 to 27 percent
Content of rock fragments—0 to 25 percent pebbles
Calcium carbonate equivalent—5 to 40 percent
Reaction—pH 7.4 to 8.4

Sawbuck Series

Depth class: Deep (40 to 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, escarpments, and side slopes of hills and mountains
Parent material: Colluvium and residuum derived mainly from granite
Slope range: 2 to 45 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Sawbuck gravelly sandy loam, in an area of Sawbuck-Catgulch, stony, complex, 8 to 45 percent slopes; in a forested area, 1,500 feet north and 1,600 feet west of the southeast corner of sec. 14, T. 7 N., R. 4 W.

Oi—1 inch to 0; forest litter of partially decomposed twigs and needles.
A—0 to 6 inches; very dark grayish brown (10YR 3/2) gravelly sandy loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; many very fine and fine roots; slightly hard, friable, slightly sticky and nonplastic; 20 percent pebbles; neutral (pH 6.6); clear smooth boundary.
Bt1—6 to 12 inches; brown (10YR 4/3) very gravelly sandy clay loam, dark brown (10YR 3/3) moist; moderate medium and fine subangular blocky

structure; hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots and few medium roots; many very fine pores; common distinct dark brown (10YR 3/3) (moist) clay films on faces of peds and bridging sand grains; 5 percent angular cobbles and 45 percent angular pebbles; neutral (pH 6.6); clear smooth boundary.

Bt2—12 to 17 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium and fine subangular blocky structure; hard, friable, moderately sticky and moderately plastic; many very fine and fine roots and common medium roots; common fine and very fine pores; many distinct dark brown (10YR 3/3) (moist) clay films on faces of peds and lining pores; 10 percent angular cobbles and 30 percent angular pebbles; neutral (pH 6.8); clear wavy boundary.

Bt3—17 to 23 inches; light yellowish brown (10YR 6/4) very gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium roots; many very fine pores; common distinct clay films on faces of peds; 5 percent angular cobbles and 40 percent angular pebbles; neutral (pH 6.8); gradual wavy boundary.

BC—23 to 46 inches; very pale brown (10YR 7/4) extremely gravelly sandy clay loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium roots; many very fine pores; 20 percent angular cobbles and 50 percent angular pebbles; moderately acid (pH 5.6); gradual wavy boundary.

Cr—46 to 60 inches; very pale brown (10YR 7/4), decomposing granite bedrock that crushes to extremely gravelly loamy coarse sand.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 10 to 15 inches
Depth to Bt horizon: 5 to 16 inches
Depth to Cr horizon: 40 to 60 inches
Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
Value—3, 4, or 5 dry; 2 or 3 moist
Chroma—1 or 2
Texture—loam, sandy clay loam, or sandy loam
Clay content—10 to 30 percent
Content of rock fragments—15 to 30 percent (0 to 5 percent stones, 0 to 5 percent angular cobbles, 15 to 20 percent angular pebbles)
Reaction—pH 6.1 to 7.3

Bt1 horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3 or 4 moist
Chroma—2 or 3
Texture—sandy clay loam, clay loam, or loam
Clay content—25 to 35 percent
Content of rock fragments—15 to 55 percent (5 to 10 percent angular cobbles, 10 to 45 percent angular pebbles)
Reaction—pH 6.1 to 7.3

Bt2 and Bt3 horizons:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—clay loam, loam, or sandy clay loam
Clay content—25 to 35 percent
Content of rock fragments—35 to 60 percent (5 to 10 percent angular cobbles, 30 to 50 percent angular pebbles)
Reaction—pH 6.1 to 7.3

BC horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—sandy clay loam, sandy loam, or loam
Clay content—15 to 25 percent
Content of rock fragments—15 to 70 percent (5 to 20 percent angular cobbles, 10 to 50 percent angular pebbles)
Reaction—pH 5.6 to 6.5

Sawicki Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, escarpments, and side slopes of hills and mountains
Parent material: Colluvium and slope alluvium derived from hard, fine grained igneous rock
Slope range: 4 to 70 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 38 to 42 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Sawicki cobbly loam, in an area of Blaincreek, very stony-Sawicki, very stony-Tolbert, very bouldery, complex, 35 to 70 percent slopes, in rangeland, 200 feet south and 2,650 feet west of the northeast corner of sec. 9, T. 3 N., R. 3 W.

A—0 to 8 inches; dark brown (10YR 3/3) cobbly loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 15 percent angular cobbles and 15 percent angular pebbles; slightly acid (pH 6.4); clear wavy boundary.

Bt1—8 to 14 inches; dark grayish brown (10YR 4/2) very cobbly clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine tubular pores; common distinct brown (10YR 4/3) clay films on faces of peds; 25 percent angular cobbles and 15 percent angular pebbles; neutral (pH 6.6); gradual wavy boundary.

Bt2—14 to 25 inches; brown (10YR 5/3) very cobbly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots and common medium roots; many very fine and fine pores; common faint brown (10YR 4/3) clay films on faces of peds; 30 percent angular cobbles and 25 percent angular pebbles; neutral (pH 6.6); gradual irregular boundary.

BC—25 to 51 inches; light brownish gray (10YR 6/2) very cobbly loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and common medium roots; many very fine and fine pores; 40 percent angular cobbles and 20 percent angular pebbles; neutral (pH 7.2); gradual irregular boundary.

C—51 to 60 inches; light brownish gray (10YR 6/2) extremely cobbly loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; many very fine roots; many very fine and fine pores; 55 percent angular cobbles and 25 percent angular pebbles; neutral (pH 7.2).

Range in Characteristics

Soil temperature: 38 to 42 degrees F

Moisture control section: Between the depths of 4 and 12 inches

Thickness of the mollic epipedon: 8 to 16 inches

Depth to Bt horizon: 7 to 13 inches

Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—3 or 4 dry; 2 or 3 moist
- Chroma—2 or 3
- Texture—loam, sandy clay loam, or sandy loam
- Clay content—10 to 30 percent
- Content of rock fragments—15 to 50 percent (0 to 25 percent stones and cobbles, 15 to 40 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bt1 horizon:
- Hue—10YR or 2.5Y
- Value—4 or 5 dry; 3 or 4 moist
- Chroma—2 or 3
- Texture—loam, sandy clay loam, or clay loam
- Clay content—22 to 35 percent
- Content of rock fragments—35 to 60 percent (15 to 35 percent stones and cobbles, 15 to 40 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bt2 horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2, 3, or 4
- Texture—loam, sandy loam, or sandy clay loam
- Clay content—18 to 27 percent
- Content of rock fragments—35 to 60 percent (15 to 45 percent stones and cobbles, 20 to 40 percent pebbles)
- Reaction—pH 6.1 to 7.3

BC horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2, 3, or 4
- Texture—coarse sandy loam, loam, sandy loam, or sandy clay loam
- Clay content—18 to 27 percent
- Content of rock fragments—35 to 60 percent (15 to 45 percent stones and cobbles, 20 to 40 percent pebbles)
- Reaction—pH 6.1 to 7.3

C horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4

Texture—loam, coarse sandy loam, sandy clay loam, or sandy loam
Clay content—15 to 22 percent
Content of rock fragments—35 to 70 percent (15 to 55 percent stones and cobbles, 20 to 40 percent pebbles)
Reaction—pH 6.1 to 7.3

Sebud Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans and side slopes of mountains
Parent material: Slope alluvium and colluvium derived mainly from igneous and metamorphic rock
Slope range: 2 to 60 percent
Elevation range: 5,500 to 8,000 feet
Annual precipitation: 15 to 30 inches
Annual air temperature: 34 to 44 degrees F
Frost-free period: 30 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Ustic Haplocryolls

Typical Pedon

Sebud very gravelly loam, in an area of Sebud, stony-Surdal, stony-Arrowpeak, very stony, complex, 35 to 60 percent slopes, in rangeland, 300 feet west and 800 feet north of the southeast corner of sec. 13, T. 3 N., R. 4 W.

A—0 to 10 inches; very dark grayish brown (10YR 3/2) very gravelly loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; 10 percent rounded cobbles and 25 percent rounded pebbles; slightly acid (pH 6.4); clear wavy boundary.
Bw1—10 to 23 inches; yellowish brown (10YR 5/4) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; many very fine and fine roots and few medium roots; many very fine and fine pores; 10 percent rounded cobbles and 30 percent rounded pebbles; neutral (pH 6.6); clear wavy boundary.
Bw2—23 to 32 inches; brown (10YR 5/3) very gravelly loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; many very fine and fine pores; 10 percent rounded cobbles and 35 percent rounded pebbles; neutral (pH 6.8); gradual wavy boundary.
BC—32 to 44 inches; brown (10YR 5/3) very gravelly loam, brown (10YR 4/3) moist; moderate medium and coarse subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots and few medium and coarse roots; many very fine and fine pores; 20 percent rounded cobbles and 40 percent rounded pebbles; neutral (pH 7.2); gradual irregular boundary.
C—44 to 60 inches; brown (10YR 5/3) extremely gravelly loam, grayish brown (10YR 5/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; few very fine and fine pores; 10 percent rounded cobbles and 60 percent rounded pebbles; neutral (pH 7.2).

Range in Characteristics

Soil temperature: 36 to 42 degrees F
Moisture control section: Between the depths of 6 and 18 inches
Thickness of the mollic epipedon: 10 to 16 inches
Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
Hue—2.5Y or 10YR
Value—3 or 4 dry; 2 or 3 moist
Chroma—1, 2, or 3
Clay content—15 to 27 percent
Content of rock fragments—10 to 60 percent (5 to 45 percent cobbles, 5 to 25 percent pebbles)
Reaction—pH 6.1 to 7.8

Bw horizon:
Hue—2.5Y or 10YR
Value—5, 6, or 7 dry; 3, 4, or 5 moist
Chroma—2, 3, or 4
Texture—loam or sandy clay loam
Clay content—12 to 27 percent
Content of rock fragments—35 to 60 percent (10 to 20 percent cobbles, 25 to 40 percent pebbles)
Reaction—pH 6.6 to 7.8

BC horizon:
Hue—2.5Y or 10YR
Value—5, 6, or 7 dry; 3, 4, or 5 moist
Chroma—2, 3, or 4
Texture—loam or sandy clay loam
Clay content—12 to 27 percent
Content of rock fragments—35 to 60 percent (10 to 20 percent cobbles, 25 to 40 percent pebbles)
Reaction—pH 6.6 to 7.8

C horizon:
Hue—2.5Y or 10YR
Value—5, 6, or 7 dry; 3, 4, or 5 moist
Chroma—2, 3, or 4
Texture—loam or sandy clay loam
Clay content—12 to 27 percent
Content of rock fragments—35 to 85 percent (10 to 25 percent cobbles, 25 to 60 percent pebbles)
Reaction—pH 6.6 to 7.8

Shaboom Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of hills
Parent material: Slope alluvium and residuum derived from granite
Slope range: 4 to 75 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 38 to 42 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Lithic Haplustepts

Typical Pedon

Shaboom gravelly coarse sandy loam, in an area of Lumpgulch, bouldery-Hoyt-Shaboom, very bouldery, complex, 4 to 15 percent slopes; in a forested area, 3,350 feet north and 1,650 feet east of the southwest corner of sec. 32, T. 9 N., R. 2 W.

Oi—1 inch to 0; forest litter of partially decomposed needles, twigs, and leaves.
A—0 to 3 inches; brown (10YR 5/3) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak fine and very fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine, few fine, and few medium roots; 5 percent cobbles and 20 percent pebbles; neutral (pH 7.1); clear wavy boundary.
Bw—3 to 12 inches; very pale brown (10YR 7/4) very gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine and medium subangular blocky structure parting to weak fine and very fine granular; soft, very friable, slightly sticky and nonplastic; many very fine roots and few fine and medium roots; many very fine tubular pores; 15 percent cobbles and 35 percent pebbles; neutral (pH 6.8); clear wavy boundary.
R—12 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)
Depth to bedrock: 10 to 20 inches
Percent of surface covered by boulders: 0.01 to 15 percent

A horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2 or 3
Texture—coarse sandy loam, sandy loam, sandy clay loam, or loam
Clay content—12 to 25 percent
Content of rock fragments—10 to 35 percent (0 to 15 percent cobbles, 10 to 20 percent pebbles)
Reaction—pH 6.1 to 7.3

Bw horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—coarse sandy loam, sandy loam, or sandy clay loam
Clay content—18 to 25 percent
Content of rock fragments—35 to 60 percent (5 to 15 percent cobbles, 30 to 45 percent pebbles)
Reaction—pH 5.6 to 7.3

Shawmut Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, escarpments, and side slopes of hills
Parent material: Slope alluvium and colluvium derived from hard, fine grained igneous rock
Slope range: 2 to 45 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 38 to 42 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Shawmut very gravelly loam, in an area of

Martinsdale-Shawmut, stony-Martinsdale, bouldery, complex, 4 to 25 percent slopes, warm, in rangeland, 1,000 feet south and 1,600 feet east of the northwest corner of sec. 16, T. 9 N., R. 2 W.

A1—0 to 3 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; 10 percent rounded cobbles and 30 percent rounded pebbles; slightly acid (pH 6.2); clear smooth boundary.

A2—3 to 7 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium roots; many very fine and fine pores; 10 percent rounded cobbles and 15 percent rounded pebbles; slightly acid (pH 6.4); clear smooth boundary.

Bt1—7 to 14 inches; brown (10YR 5/3) very cobbly clay loam, brown (10YR 4/3) moist; strong medium subangular blocky structure; hard, friable, moderately sticky and moderately plastic; many very fine and fine roots and few medium and coarse roots; many very fine and fine pores; common distinct brown (10YR 4/3) clay films on faces of peds and bridging sand grains; 20 percent rounded cobbles and 20 percent rounded pebbles; neutral (pH 6.7); clear wavy boundary.

Bt2—14 to 19 inches; pale brown (10YR 6/3) very cobbly clay loam, brown (10YR 4/3) moist; strong medium subangular blocky structure; hard, friable, moderately sticky and moderately plastic; many very fine and fine roots and few medium and coarse roots; many very fine and fine pores; common distinct brown (10YR 4/3) clay films on faces of peds and bridging sand grains; 20 percent rounded cobbles and 20 percent rounded pebbles; neutral (pH 6.8); clear wavy boundary.

Bk1—19 to 32 inches; light gray (10YR 7/2) very gravelly loam, pale brown (10YR 6/3) moist; moderate coarse subangular blocky structure; hard, friable, moderately sticky and moderately plastic; many very fine and fine roots and common medium and coarse roots; many very fine and fine pores; 15 percent rounded cobbles and 30 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, common distinct lime coatings on undersides of fragments; violently effervescent; moderately alkaline (pH 8.3); clear smooth boundary.

Bk2—32 to 60 inches; very pale brown (10YR 8/3) very gravelly loam, light gray (10YR 7/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common fine and very fine pores; 15 percent rounded cobbles and 35 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, many distinct lime casts on fragments; violently effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 13 inches
Depth to Bt horizon: 3 to 11 inches
Depth to Bk horizon: 11 to 24 inches
Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—3, 4, or 5 dry; 2 or 3 moist
- Chroma—2 or 3
- Texture—loam or sandy clay loam
- Clay content—15 to 27 percent
- Content of rock fragments—15 to 50 percent (0 to 25 percent stones and cobbles, 15 to 40 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bt horizon:
- Hue—10YR or 2.5Y
- Value—4, 5, or 6 dry; 3 or 4 moist
- Chroma—2 or 3
- Texture—sandy clay loam or clay loam
- Clay content—25 to 35 percent
- Content of rock fragments—35 to 60 percent (15 to 35 percent stones and cobbles, 15 to 40 percent pebbles)
- Calcium carbonate equivalent—0 to 5 percent
- Reaction—pH 6.6 to 7.8

Bk horizon:
- Hue—10YR or 2.5Y
- Value—6, 7, or 8 dry; 4, 5, 6, or 7 moist
- Chroma—2, 3, or 4
- Texture—loam, sandy loam, or sandy clay loam
- Clay content—10 to 25 percent
- Content of rock fragments—35 to 80 percent (15 to 45 percent stones and cobbles, 20 to 40 percent pebbles)
- Calcium carbonate equivalent—10 to 30 percent
- Reaction—pH 7.9 to 9.0

Shoddy Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Slow (0.06 to 0.2 inch per hour)
Landform: Hills, knolls, and ridges
Parent material: Slope alluvium and residuum derived from semiconsolidated shale
Slope range: 2 to 45 percent
Elevation range: 4,000 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Clayey, mixed, superactive, frigid, shallow Aridic Haplustepts

Typical Pedon

Shoddy silty clay loam, in an area of Shoddy-Cabbart-Kobarter complex, 4 to 25 percent slopes, in rangeland, 200 feet north and 950 feet west of the southeast corner of sec. 5, T. 1 N., R. 5 W.

A—0 to 1 inch; pale brown (10YR 6/3) silty clay loam, grayish brown (2.5Y 5/2) moist; strong very fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; 5 percent rounded pebbles; disseminated lime; slightly effervescent; slightly alkaline (pH 7.6); clear smooth boundary.

Bw—1 to 5 inches; pale brown (10YR 6/3) silty clay loam, dark grayish brown (10YR 4/2) moist; strong medium prismatic structure parting to moderate medium subangular blocky; hard, friable, moderately sticky and moderately plastic; many very fine and fine roots; many very fine and fine pores; disseminated lime; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bk1—5 to 10 inches; pale brown (10YR 6/3) silty clay loam, olive gray (5Y 5/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, moderately sticky and moderately plastic; many very fine and fine roots; common fine and many very fine pores; 25 percent soft angular shale fragments; disseminated lime, few fine masses and threads of lime; strongly effervescent; moderately alkaline (pH 8.2); clear wavy boundary.

Bk2—10 to 16 inches; light gray (2.5Y 7/2) silty clay loam, grayish brown (2.5Y 5/2) moist; moderate fine and medium angular blocky structure; hard, friable, moderately sticky and moderately plastic; common very fine and fine roots between shale fragments; common very fine pores; 60 percent soft angular shale fragments; disseminated lime, many faint lime coatings on undersides of shale fragments; strongly effervescent; moderately alkaline (pH 8.4); clear wavy boundary.

Cr1—16 to 38 inches; light gray (10YR 7/2), semiconsolidated shale that crushes to silty clay loam.

Cr2—38 to 60 inches; light gray (2.5Y 7/2), semiconsolidated shale that crushes to silt loam.

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the paralithic contact (if it occurs at a depth of less than 12 inches)
Depth to Bk horizon: 3 to 7 inches
Depth to Cr horizon: 10 to 20 inches

A horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2 or 3
Clay content—27 to 40 percent
Content of rock fragments—0 to 15 percent pebbles (from mixed rock sources)
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 7.4 to 9.0

Bw horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2 or 3
Texture—silty clay loam, silty clay, or clay loam
Clay content—27 to 45 percent
Content of rock fragments—0 to 15 percent pebbles (from mixed rock sources)
Calcium carbonate equivalent—0 to 10 percent
Reaction—pH 7.4 to 9.0

Bk horizon:
Hue—7.5YR, 10YR, 5Y, or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—silty clay, silty clay loam, or clay loam
Clay content—35 to 50 percent
Content of rock fragments—15 to 60 percent soft angular shale fragments
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.4 to 9.0

Sieben Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained

Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Stream terraces, alluvial fans, and side slopes of hills
Parent material: Alluvium derived from mixed rock sources
Slope range: 1 to 60 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Calcidic Argiustolls

Typical Pedon

Sieben gravelly sandy loam, in an area of Sieben complex, 2 to 8 percent slopes, 550 feet south and 2,300 feet east of the northwest corner of sec. 9, T. 3 N., R. 4 W.

A—0 to 6 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 3/3) moist; moderate medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; 5 percent rounded cobbles and 20 percent rounded pebbles; neutral (pH 7.2); clear smooth boundary.

Bt1—6 to 11 inches; dark yellowish brown (10YR 4/4) very gravelly sandy clay loam, dark yellowish brown (10YR 3/4) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium roots; many very fine and fine pores; common faint dark grayish brown (10YR 4/2) (moist) clay films on faces of peds and bridging sand grains; 5 percent rounded cobbles and 30 percent rounded pebbles; slightly alkaline (pH 7.4); clear smooth boundary.

Bt2—11 to 15 inches; brown (10YR 5/3) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and few medium roots; many very fine and fine pores; few faint dark grayish brown (10YR 4/2) (moist) clay films on faces of peds and bridging sand grains; 5 percent rounded cobbles and 35 percent rounded pebbles; slightly alkaline (pH 7.6); clear wavy boundary.

Bk1—15 to 24 inches; brown (10YR 5/3) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak coarse subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots and few medium roots; many very fine and fine pores; 5 percent rounded cobbles and 45 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, common faint lime coatings on undersides of fragments; violently effervescent; moderately alkaline (pH 7.9); gradual wavy boundary.

Bk2—24 to 60 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; few very fine and fine roots; common fine and very fine pores; 10 percent rounded cobbles and 45 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, many distinct lime casts on undersides of fragments; violently effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 10 inches
Depth to Bk horizon: 12 to 18 inches
Percent of surface covered by stones/boulders: 0 to 20 percent

A horizon:
- Hue—10YR or 2.5Y
- Chroma—2 or 3
- Texture—loam or sandy loam
- Clay content—10 to 27 percent
- Content of rock fragments—10 to 60 percent (0 to 30 percent cobbles and stones, 10 to 30 percent pebbles)
- Calcium carbonate equivalent—0 to 3 percent
- Reaction—pH 6.6 to 7.3

Bt horizon:
- Hue—10YR or 2.5Y
- Value—4, 5, or 6 dry; 3 or 4 moist
- Chroma—3 or 4
- Texture—sandy loam, sandy clay loam, loam, or clay loam
- Clay content—20 to 35 percent
- Content of rock fragments—35 to 60 percent (0 to 5 percent cobbles and stones, 35 to 50 percent pebbles)
- Calcium carbonate equivalent—0 to 5 percent
- Reaction—pH 6.6 to 7.8

Bk horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4

Texture—sandy loam, loam, or coarse sandy loam
Clay content—10 to 27 percent
Content of rock fragments—50 to 80 percent (5 to 20 percent cobbles and stones, 45 to 60 percent pebbles)
Calcium carbonate equivalent—10 to 30 percent
Reaction—pH 7.9 to 9.0

Sieberell Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour) above the 2C horizon and rapid (6.0 to 20.0 inches per hour) in the 2C horizon
Landform: Stream terraces, alluvial fans, and side slopes of hills
Parent material: Slope alluvium derived from mixed rock sources
Slope range: 1 to 15 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Loamy-skeletal over sandy or sandy-skeletal, mixed, superactive, frigid Aridic Argiustolls

Typical Pedon

Sieberell very gravelly loam, in an area of Sieberell-Sieben-Beaverell complex, 4 to 15 percent slopes, stony, in rangeland, 1,600 feet south and 100 feet east of the northwest corner of sec. 9, T. 4 N., R. 3 W.

A—0 to 6 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine subangular blocky structure; soft, very friable, moderately sticky and slightly plastic; many very fine and few fine roots; many very fine and fine pores and few medium pores; 10 percent rounded cobbles and 30 percent rounded pebbles; neutral (pH 6.6); clear smooth boundary.

Bt—6 to 11 inches; light olive brown (2.5Y 5/4) very gravelly clay loam, olive brown (2.5Y 4/4) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, moderately sticky and moderately plastic; many very fine and few fine roots; many very fine and few fine pores; many distinct olive brown (2.5Y 4/4) clay films on faces of peds and bridging sand grains; 10 percent rounded cobbles and 30 percent rounded pebbles; neutral (pH 6.8); clear wavy boundary.

Bk—11 to 30 inches; pale yellow (2.5Y 7/4) extremely cobbly sandy clay loam, light yellowish brown (2.5Y 6/4) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and few fine roots; common very fine pores; 30 percent rounded cobbles and 45 percent rounded pebbles; disseminated lime, common faint lime coatings on tops and sides of fragments, common distinct lime casts on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

2C—30 to 60 inches; light yellowish brown (2.5Y 6/4) extremely cobbly loamy sand, light olive brown (2.5Y 5/4) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 10 percent stones, 30 percent rounded cobbles, and 35 percent rounded pebbles; common prominent lime casts on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.0).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 9 inches
Depth to Bt horizon: 5 to 8 inches
Depth to Bk horizon: 10 to 15 inches
Depth to 2C horizon: 20 to 40 inches
Percent of surface covered by stones/boulders: 0.01 to 3.0 percent

A horizon:
Hue—10YR or 2.5Y
Chroma—2 or 3
Clay content—18 to 27 percent
Content of rock fragments—35 to 50 percent (5 to 20 percent cobbles and stones, 20 to 30 percent pebbles)
Reaction—pH 6.6 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—3 or 4
Texture—sandy clay loam, loam, or clay loam
Clay content—25 to 35 percent
Content of rock fragments—35 to 60 percent (10 to 20 percent cobbles, 25 to 40 percent pebbles)
Reaction—pH 6.6 to 7.8

Bk horizon:
Hue—10YR or 2.5Y
Value—6, 7, or 8 dry; 5, 6, or 7 moist
Chroma—2, 3, or 4
Texture—sandy loam, sandy clay loam, or loam
Clay content—15 to 25 percent
Content of rock fragments—45 to 75 percent (20 to 30 percent cobbles, 25 to 45 percent pebbles)
Calcium carbonate equivalent—3 to 15 percent
Reaction—pH 7.9 to 8.4

2C horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—3 or 4
Texture—coarse sand, loamy coarse sand, or loamy sand
Clay content—0 to 10 percent
Content of rock fragments—50 to 80 percent (0 to 10 percent stones, 20 to 30 percent cobbles, 30 to 40 percent pebbles)
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 7.4 to 8.4

Sigbird Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Somewhat excessively drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of mountains
Parent material: Slope alluvium and residuum derived from hard shale or argillite
Slope range: 25 to 70 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Lithic Eutrocryepts

Typical Pedon

Sigbird very channery loam, in an area of Sigbird, very bouldery-Sigbird, stony-Rock outcrop complex, 25 to 70 percent slopes; in a forested area, 700 feet south and 350 feet west of the northeast corner of sec. 12, T. 5 N., R. 2 W.

A—0 to 5 inches; brown (10YR 5/3) very channery loam, dark brown (10YR 3/3) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots; 10 percent flagstones and 50 percent channers; neutral (pH 7.2); clear wavy boundary.
Bw—5 to 14 inches; pale brown (10YR 6/3) extremely channery loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; common fine and very fine pores; 15 percent flagstones and 60 percent channers; slightly alkaline (pH 7.4); clear smooth boundary.
R—14 inches; gray (10YR 5/1), fractured, hard shale.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)
Depth to bedrock: 10 to 20 inches
Percent of surface covered by stones/boulders: 0.01 to 3.0 percent

A horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 3 or 4 moist
Chroma—2 or 3
Clay content—18 to 27 percent
Content of rock fragments—25 to 60 percent (0 to 10 percent flagstones, 25 to 60 percent channers)
Reaction—pH 6.1 to 7.3

Bw horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5, 6, or 7
Chroma—2 or 3
Texture—loam or sandy loam
Clay content—15 to 27 percent
Content of rock fragments—35 to 80 percent (0 to 20 percent flagstones, 35 to 60 percent channers)
Reaction—pH 6.6 to 7.8

Silverchief Family

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Alluvial fans and side slopes of hills and mountains
Parent material: Slope alluvium derived from mixed rock sources
Slope range: 8 to 35 percent

Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 90 to 105 days

Taxonomic classification: Fine, mixed, superactive, frigid Calcic Haplustalfs

Typical Pedon

Silverchief very cobbly clay loam, 8 to 35 percent slopes, bouldery, in a forested area, 2,500 feet west and 1,900 feet north of the southeast corner of sec. 3, T. 9 N., R. 3 W.

Oi—1 inch to 0; organic mat of needles, leaves, and twigs.

A—0 to 4 inches; dark gray (10YR 4/1) very cobbly clay loam, very dark gray (10YR 3/1) moist; strong medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic; many very fine and fine roots and few medium and coarse roots; many very fine and fine pores; 20 percent cobbles and 20 percent pebbles; slightly acid (pH 6.2); clear smooth boundary.

Bt—4 to 11 inches; brown (10YR 5/3) clay, brown (10YR 4/3) moist; strong medium prismatic structure parting to strong medium subangular blocky; hard, firm, moderately sticky and moderately plastic; many very fine and fine roots and few medium and coarse roots; many very fine and fine pores; common distinct brown (10YR 4/3 moist) clay films on faces of peds; 10 percent granite pebbles; neutral (pH 6.6); clear wavy boundary.

Btk—11 to 14 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; many very fine and fine roots and common medium and coarse roots; many very fine and fine pores; few faint brown (10YR 4/3) (moist) clay films on faces of peds; 5 percent granite pebbles; disseminated lime, common fine and medium threads and masses of lime, common faint lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

2C1—14 to 25 inches; pale yellow (2.5Y 7/4) very stony sandy loam, light brownish gray (2.5Y 6/2) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium and coarse roots; many very fine and fine pores; 20 percent stones, 15 percent cobbles, and 10 percent pebbles; disseminated lime; strongly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

2C2—25 to 60 inches; pale brown (10YR 6/3) very stony sandy loam, brown (10YR 5/3) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine pores; 20 percent stones, 20 percent cobbles, and 15 percent pebbles; disseminated lime; slightly effervescent; slightly alkaline (pH 7.8).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to calcic horizon: 14 to 24 inches
Percent of surface covered by boulders: 0.01 to 0.1 percent

A horizon:
- Value—4, 5, or 6 dry; 3, 4, or 5 moist
- Chroma—1, 2, 3, or 4
- Clay content—35 to 40 percent
- Content of rock fragments—35 to 60 percent (20 to 30 percent cobbles, 15 to 30 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bt horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—3, 4, or 6
- Texture—clay or clay loam
- Clay content—35 to 50 percent
- Content of rock fragments—5 to 35 percent (0 to 15 percent cobbles, 5 to 20 percent pebbles)
- Reaction—pH 6.6 to 7.8

Btk horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—3 or 4
- Texture—clay, clay loam, or sandy clay loam
- Clay content—20 to 45 percent
- Content of rock fragments—5 to 50 percent (0 to 15 percent cobbles, 5 to 35 percent pebbles)
- Calcium carbonate equivalent—0 to 5 percent
- Reaction—pH 7.4 to 8.4

2C horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—sandy loam or coarse sandy loam
- Clay content—10 to 20 percent

Content of rock fragments—35 to 70 percent (15 to 45 percent cobbles and stones, 10 to 35 percent pebbles)
Calcium carbonate equivalent—3 to 35 percent
Reaction—pH 6.6 to 8.4

Sixbeacon Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour) above the 2Bk horizon and rapid (6.0 to 20.0 inches per hour) in the 2Bk horizon
Landform: Stream terraces, alluvial fans, and valley floors
Parent material: Alluvium derived from mixed rock sources
Slope range: 1 to 15 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Aridic Haplustolls

Typical Pedon

Sixbeacon loam, 2 to 8 percent slopes, in rangeland, 250 feet south and 900 feet east of the northwest corner of sec. 27, T. 1 N., R. 1 W.

Ap—0 to 4 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; 5 percent rounded pebbles; slightly alkaline (pH 7.8); abrupt smooth boundary.
Bw—4 to 9 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; strong coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots; many fine and very fine pores; 10 percent rounded pebbles; slightly alkaline (pH 7.8); clear wavy boundary.
Bk1—9 to 12 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; moderate medium prismatic structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and few medium roots; many very fine and fine pores; 10 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, common faint lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.
2Bk2—12 to 32 inches; very pale brown (10YR 7/3) very gravelly sandy loam, pale brown (10YR 6/3) moist; moderate fine subangular blocky structure; many very fine and fine roots; many very fine and fine pores; 5 percent rounded cobbles and 40 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, many distinct lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.4); gradual irregular boundary.
2Bk3—32 to 60 inches; light gray (10YR 7/2) very gravelly sandy loam, pale brown (10YR 6/3) moist; single grain; loose, nonsticky and nonplastic; few fine roots; 10 percent cobbles and 45 percent pebbles; disseminated lime, many distinct lime casts on fragments; violently effervescent; strongly alkaline (pH 8.6).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 6 and 18 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bk horizon: 8 to 13 inches

Ap horizon:
Hue—10YR or 2.5Y
Chroma—2 or 3
Texture—sandy loam or loam
Clay content—12 to 27 percent
Content of rock fragments—0 to 35 percent (0 to 15 percent cobbles, 0 to 20 percent pebbles)
Reaction—pH 6.6 to 7.8

Bw horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3 or 4 moist
Chroma—2, 3, or 4
Texture—loam or sandy clay loam
Clay content—20 to 27 percent
Content of rock fragments—0 to 35 percent (0 to 10 percent cobbles, 0 to 25 percent pebbles)
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 6.6 to 8.4

Bk1 horizon:
Hue—10YR or 2.5Y
Value—5, 6, 7, or 8 dry; 4, 5, 6, or 7 moist
Chroma—1, 2, 3, or 4
Texture—sandy loam or loam
Clay content—10 to 20 percent
Content of rock fragments—5 to 35 percent (0 to 5 percent cobbles, 5 to 30 percent pebbles)

Calcium carbonate equivalent—15 to 25 percent
Reaction—pH 7.9 to 8.4

2Bk horizon:
Hue—10YR or 2.5Y
Value—6, 7, or 8 dry; 6 or 7 moist
Chroma—2, 3, or 4
Texture—sandy loam, coarse sandy loam, or loamy sand
Clay content—0 to 10 percent
Content of rock fragments—35 to 60 percent (0 to 10 percent cobbles, 35 to 50 percent pebbles)
Calcium carbonate equivalent—5 to 20 percent
Reaction—pH 7.9 to 9.0

Skyview Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of hills
Parent material: Local colluvium, slope alluvium, and residuum derived from granite
Slope range: 8 to 60 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 38 to 42 degrees F
Frost-free period: 90 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Haplustalfs

Typical Pedon

Skyview very cobbly sandy loam, in an area of Elmark, very bouldery-Skyview, very bouldery-Rock outcrop complex, 15 to 45 percent slopes; in a forested area, 1,400 feet north and 1,000 feet west of the southeast corner of sec. 18, T. 9 N., R. 3 W.

Oi—2 inches to 0; organic mat of partially decomposed needles, leaves, and twigs.
A—0 to 4 inches; gray (10YR 5/1) very cobbly sandy loam, very dark gray (10YR 3/1) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine, common fine, and few medium roots; many very fine and fine pores and few medium pores; 35 percent cobbles and 15 percent pebbles; neutral (pH 7.0); clear smooth boundary.
E—4 to 16 inches; light brownish gray (2.5Y 6/2) very cobbly sandy loam, dark grayish brown (2.5Y 4/2) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine, common fine, and few medium roots; many very fine and few fine pores; 10 percent stones, 25 percent cobbles, and 20 percent pebbles; neutral (pH 6.7); gradual wavy boundary.
Bt/E—16 to 25 inches; 75 percent brown (10YR 5/3) very cobbly sandy clay loam, brown (10YR 4/3) moist (Bt part); 25 percent light brownish gray (10YR 6/2) very cobbly sandy loam, grayish brown (10YR 5/2) moist (E part); moderate medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium roots; many very fine and few fine pores; many faint clay films bridging sand grains in Bt part; 10 percent stones, 25 percent cobbles, and 15 percent pebbles; slightly acid (pH 6.5); clear wavy boundary.
Cr—25 to 29 inches; light yellowish brown (2.5Y 6/4), decomposed granite bedrock (grus) that crushes to very gravelly coarse sand.
R—29 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt/E horizon: 9 to 16 inches
Depth to Cr horizon: 20 to 38 inches
Depth to R layer: 23 to 40 inches
Percent of surface covered by boulders: 0.1 to 3.0 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—1, 2, or 3
Texture—sandy loam or loam
Clay content—10 to 25 percent
Content of rock fragments—20 to 60 percent (0 to 5 percent stones, 5 to 35 percent cobbles, 15 to 25 percent pebbles)
Reaction—pH 6.1 to 7.3

E horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 4 or 5 moist
Chroma—1, 2, or 3
Texture—sandy loam or sandy clay loam
Clay content—10 to 25 percent
Content of rock fragments—35 to 60 percent (0 to 10 percent stones, 15 to 25 percent cobbles, 20 to 25 percent pebbles)

Reaction—pH 6.1 to 7.3

Bt/E horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry, 4 or 5 moist (Bt part); 6 or 7 dry, 5 or 6 moist (E part)
Chroma—2, 3, or 4
Texture—sandy clay loam (Bt part); sandy loam or sandy clay loam (E part)
Clay content—18 to 30 percent
Content of rock fragments—35 to 60 percent (0 to 10 percent stones, 20 to 25 percent cobbles, 15 to 25 percent pebbles)
Reaction—pH 6.1 to 7.3

Stemple Family

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments and side slopes of mountains
Parent material: Colluvium and slope alluvium derived from fine grained igneous and argillite rocks
Slope range: 35 to 60 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Typic Palecryalfs

Typical Pedon

Stemple cobbly loam, 35 to 60 percent slopes, very stony, in a forested area, 2,450 feet south and 1,700 feet west of the northeast corner of sec. 36, T. 9 N., R. 3 W.

Oi—2 inches to 0; forest litter of partially decomposed needles, twigs, and roots.
E1—0 to 4 inches; light brownish gray (10YR 6/2) cobbly loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; 15 percent cobbles and 10 percent pebbles; neutral (pH 6.6); clear wavy boundary.
E2—4 to 19 inches; light gray (10YR 7/2) very cobbly loam, grayish brown (10YR 5/2) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; many very fine pores; 40 percent cobbles and 20 percent pebbles; moderately acid (pH 5.6); clear wavy boundary.
E/Bt—19 to 36 inches; 70 percent tongues of light brownish gray (10YR 6/2) extremely cobbly loam, grayish brown (10YR 5/2) moist (E part); 30 percent yellowish brown (10YR 5/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist (Bt part); moderate medium and fine subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; common very fine and fine roots and few medium roots; many very fine pores; common distinct clay films on faces of peds; many silt and sand skeletans on faces of peds; 15 percent stones, 30 percent cobbles, and 20 percent pebbles; moderately acid (pH 5.7); gradual wavy boundary.
Bt/E—36 to 60 inches; 70 percent yellowish brown (10YR 5/4) extremely cobbly loam, dark yellowish brown (10YR 4/4) moist (Bt part); 30 percent tongues of light brownish gray (10YR 6/2) extremely cobbly loam, grayish brown (10YR 5/2) moist (E part); moderate medium and fine subangular blocky structure; hard, friable, moderately sticky and moderately plastic; few fine and medium roots; many very fine pores; many distinct clay films on faces of peds; many faint silt and sand skeletans on faces of peds in the upper 6 inches; 15 percent stones, 30 percent cobbles, and 20 percent pebbles; slightly acid (pH 6.3).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt/E horizon: 25 to 50 inches
Percent of surface covered by stones/boulders: 0.1 to 3.0 percent

E1 horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 4, 5, or 6 moist
Chroma—2 or 3
Clay content—15 to 25 percent
Content of rock fragments—15 to 30 percent (10 to 20 percent cobbles or stones, 5 to 15 percent pebbles)
Reaction—pH 6.1 to 7.3

E2 horizon:
Hue—10YR or 2.5Y
Value—6, 7, or 8 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Clay content—10 to 20 percent

Content of rock fragments—35 to 80 percent (0 to 40 percent cobbles or stones, 20 to 60 percent pebbles)
Reaction—pH 5.1 to 6.5

E/Bt horizon:
Hue—7.5YR to 2.5Y
Value—6, 7, or 8 dry, 4, 5, or 6 moist (E part); 5 or 6 dry, 4 or 5 moist (Bt part)
Chroma—2, 3, or 4 (E part); 4, 5, or 6 (Bt part)
Clay content—15 to 27 percent
Content of rock fragments—35 to 80 percent (0 to 45 percent cobbles and stones, 20 to 70 percent pebbles)
Reaction—pH 5.1 to 6.5

Bt/E horizon:
Hue—7.5YR to 2.5Y
Value—5 or 6 dry, 4 or 5 moist (Bt part); 6, 7, or 8 dry, 4, 5, or 6 moist (E part)
Chroma—4, 5, or 6 (Bt part); 2, 3, or 4 (E part)
Clay content—27 to 35 percent
Content of rock fragments—60 to 80 percent (10 to 45 percent cobbles and stones, 20 to 60 percent pebbles)
Reaction—pH 5.6 to 6.5

Surdal Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of mountains
Parent material: Local colluvium, slope alluvium, and residuum derived from hard, fine grained igneous or metamorphic rock
Slope range: 2 to 60 percent
Elevation range: 5,500 to 8,000 feet
Annual precipitation: 15 to 30 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 30 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Ustic Haplocryolls

Typical Pedon

Surdal cobbly loam, in an area of Surdal, stony-Arrowpeak, very stony, complex, 4 to 25 percent slopes, in rangeland, 650 feet south and 400 feet west of the northeast corner of sec. 1, T. 3 N., R. 4 W.

A1—0 to 7 inches; dark grayish brown (10YR 4/2) cobbly loam, very dark brown (10YR 2/2) moist; moderate fine and medium granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; 10 percent cobbles and 10 percent pebbles; slightly acid (pH 6.2); clear wavy boundary.
A2—7 to 13 inches; dark grayish brown (10YR 4/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine pores; 15 percent cobbles and 25 percent pebbles; slightly acid (pH 6.2); clear wavy boundary.
Bw1—13 to 23 inches; grayish brown (10YR 5/2) very cobbly loam, brown (10YR 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine pores; 15 percent cobbles and 30 percent pebbles; slightly acid (pH 6.4); gradual wavy boundary.
Bw2—23 to 31 inches; brown (10YR 5/3) very cobbly loam, brown (10YR 4/3) moist; weak coarse subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots and few medium roots; common very fine and fine pores; 30 percent cobbles and 30 percent pebbles; slightly acid (pH 6.4); clear wavy boundary.
R—31 inches; slightly fractured, hard, fine grained igneous bedrock.

Range in Characteristics

Soil temperature: 36 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 14 inches
Depth to bedrock: 20 to 40 inches
Percent of surface covered by stones/boulders: 0.01 to 3.0 percent

A horizon:
Hue—2.5Y or 10YR
Value—3 or 4 dry; 2 or 3 moist
Clay content—18 to 27 percent
Content of rock fragments—15 to 50 percent (0 to 15 percent cobbles, stones, and boulders; 10 to 30 percent pebbles)
Reaction—pH 6.1 to 6.5

Bw1 horizon:
Hue—2.5Y or 10YR
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Texture—loam or sandy clay loam

Clay content—18 to 27 percent
Content of rock fragments—35 to 60 percent (10 to 20 percent cobbles, 25 to 40 percent pebbles)
Reaction—pH 6.1 to 6.5

Bw2 horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Texture—loam, sandy clay loam, or sandy loam
Clay content—18 to 27 percent
Content of rock fragments—35 to 80 percent (5 to 30 percent cobbles, 30 to 50 percent pebbles)
Reaction—pH 6.1 to 6.5

Tepecreek Series

Depth class: Moderately deep (20 to 40 inches) to weathered granite bedrock (grus) and deep (40 to 60 inches) to hard granite bedrock
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour) above the BC horizon and moderately rapid (2.0 to 6.0 inches per hour) in the BC horizon
Landform: Escarpments, ridges, and side slopes of mountains
Parent material: Local colluvium, slope alluvium, and residuum derived from granite
Slope range: 8 to 60 percent
Elevation range: 5,500 to 8,000 feet
Annual precipitation: 15 to 30 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 30 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Ustic Haplocryalfs

Typical Pedon

Tepecreek very gravelly sandy clay loam, in an area of Bobowic, very bouldery-Rock outcrop-Tepecreek, very bouldery, complex, 25 to 60 percent slopes; in a forested area, 1,350 feet south and 1,475 feet west of the northeast corner of sec. 32, T. 9 N., R. 2 W.

Oi—1 inch to 0; forest litter of partially decomposed needles, twigs, and leaves.
A—0 to 2 inches; grayish brown (10YR 5/2) very gravelly sandy clay loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine and fine pores and few medium pores; 35 percent granite pebbles; slightly acid (pH 6.3); clear smooth boundary.
E—2 to 8 inches; brown (10YR 5/3) very gravelly sandy clay loam, dark grayish brown (10YR 4/2) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and few fine roots; many very fine and fine pores and few medium pores; 40 percent granite pebbles; slightly acid (pH 6.2); clear smooth boundary.
Bt—8 to 18 inches; yellowish brown (10YR 5/4) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many very fine roots and few fine and medium roots; many very fine and few fine pores; many faint clay films bridging sand grains; 40 percent granite pebbles; slightly acid (pH 6.1); clear wavy boundary.
BC—18 to 35 inches; olive brown (2.5Y 4/4) very gravelly sandy loam, very dark grayish brown (2.5Y 3/2) moist; weak very fine and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine and few fine roots; many very fine and few fine pores; 55 percent granite pebbles; neutral (pH 6.6); clear wavy boundary.
Cr—35 to 52 inches; light olive brown (2.5Y 5/4), decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand.
R—52 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 5 to 12 inches
Depth to Cr horizon: 20 to 40 inches
Depth to R layer: 40 to 60 inches
Percent of surface covered by stones/boulders: 0.01 to 3.0 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Texture—coarse sandy loam or sandy clay loam
Clay content—10 to 25 percent
Content of rock fragments—5 to 50 percent pebbles
Reaction—pH 6.1 to 7.3

E horizon:
Hue—10YR or 2.5Y

Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Texture—coarse sandy loam, sandy loam, or sandy clay loam
Clay content—10 to 25 percent
Content of rock fragments—5 to 50 percent pebbles (mostly less than 7 mm in diameter)
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Clay content—20 to 30 percent
Content of rock fragments—35 to 60 percent pebbles (mostly less than 7 mm in diameter)
Reaction—pH 6.1 to 7.3

BC horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2, 3, or 4
Texture—coarse sandy loam or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—35 to 60 percent pebbles (mostly less than 10 mm in diameter)
Reaction—pH 6.1 to 7.3

Tiban Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans and side slopes of mountains
Parent material: Slope alluvium and colluvium derived mainly from igneous and metamorphic rock
Slope range: 1 to 70 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 34 to 44 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Ustic Haplocryolls

Typical Pedon

Tiban gravelly loam, in an area of Tiban, bouldery-Cheadle, very bouldery, complex, 15 to 35 percent slopes, in rangeland, 2,075 feet west and 1,600 feet north of the southeast corner of sec. 4, T. 5 N., R. 2 W.

A—0 to 7 inches; very dark grayish brown (10YR 3/2) gravelly loam, black (10YR 2/1) moist; moderate medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots and few medium roots; 25 percent pebbles; neutral (pH 6.8); clear wavy boundary.

Bw1—7 to 14 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and few medium roots; common fine and very fine pores; 40 percent pebbles; slightly alkaline (pH 7.4); clear wavy boundary.

Bw2—14 to 28 inches; brown (10YR 5/3) very gravelly loam, brown (10YR 4/3) moist; moderate medium and coarse prismatic structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and few medium roots; common fine and very fine pores; 45 percent pebbles; slightly alkaline (pH 7.6); gradual wavy boundary.

Bk1—28 to 42 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 5/3) moist; moderate coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; common fine and very fine pores; 5 percent cobbles and 40 percent pebbles; disseminated lime, common fine and medium threads and masses of lime, common faint lime coatings on undersides of fragments; violently effervescent; moderately alkaline (pH 8.3); gradual irregular boundary.

Bk2—42 to 60 inches; brown (10YR 5/3) very gravelly loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; common fine and very fine pores; 5 percent cobbles and 40 percent pebbles; disseminated lime, common fine and medium threads and masses of lime, common distinct lime coatings on fragments; strongly effervescent; moderately alkaline (pH 8.2).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bk horizon: 20 to 32 inches
Percent of surface covered by stones/boulders: 0.01 to 25 percent

A horizon:
Hue—7.5YR, 10YR, or 2.5YR
Value—3 or 4 dry; 2 or 3 moist
Chroma—1, 2, or 3
Clay content—18 to 27 percent

Content of rock fragments—15 to 70 percent (0 to 30 percent cobbles and stones, 15 to 40 percent pebbles)
Reaction—pH 6.6 to 7.3

Bw horizon:
Hue—7.5YR or 10YR
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—1, 2, or 3
Texture—loam or clay loam
Clay content—18 to 35 percent
Content of rock fragments—15 to 50 percent (0 to 20 percent cobbles and stones, 15 to 45 percent pebbles)
Calcium carbonate equivalent—0 to 8 percent
Reaction—pH 6.6 to 8.4

Bk horizon:
Hue—7.5YR or 10YR
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—1, 2, or 3
Texture—loam or clay loam
Clay content—18 to 35 percent
Content of rock fragments—15 to 60 percent (0 to 20 percent cobbles and stones, 15 to 40 percent pebbles)
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.4 to 8.4

Tibkey Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat poorly drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, valleys, and side slopes of mountains
Parent material: Slope alluvium or alpine glacial till derived from fine grained igneous and metamorphic rocks
Slope range: 2 to 15 percent
Elevation range: 5,500 to 7,500 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Fluvaquentic Haplocryolls

Typical Pedon

Tibkey mucky silt loam, in an area of Marcel, very bouldery-Tibkey, bouldery, complex, 2 to 8 percent slopes, in rangeland, 1,700 feet north and 350 feet east of the southwest corner of sec. 1, T. 4 N., R. 4 W.

A1—0 to 2 inches; very dark grayish brown (10YR 3/2) mucky silt loam, very dark brown (10YR 2/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine roots; 10 percent pebbles; slightly acid (pH 6.2); clear wavy boundary.
A2—2 to 8 inches; very dark gray (10YR 3/1) mucky silt loam, black (10YR 2/1) moist; strong medium prismatic structure parting to moderate fine and medium subangular blocky; hard, firm, slightly sticky and slightly plastic; many very fine and fine roots; many fine and very fine pores; 10 percent pebbles; neutral (pH 6.6); clear wavy boundary.
Bw1—8 to 13 inches; grayish brown (10YR 5/2) very gravelly loam, dark grayish brown (10YR 4/2) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, firm, slightly sticky and slightly plastic; many very fine and fine roots; many fine and very fine pores; 40 percent pebbles; neutral (pH 6.6); clear wavy boundary.
Bw2—13 to 25 inches; light brownish gray (10YR 6/2) very gravelly loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; 5 percent cobbles and 30 percent pebbles; neutral (pH 6.8); gradual wavy boundary.
Bw3—25 to 32 inches; light gray (10YR 7/2) very gravelly loam, brown (10YR 5/3) moist; few fine distinct yellowish brown (10YR 5/6) redox concentrations; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; 5 percent cobbles and 30 percent pebbles; neutral (pH 6.8); gradual irregular boundary.
BC—32 to 60 inches; very pale brown (10YR 7/3) very gravelly loam, pale brown (10YR 6/3) moist; common fine prominent strong brown (7.5YR 5/6) redox concentrations; massive; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine and fine pores; 5 percent cobbles and 40 percent pebbles; slightly alkaline (pH 7.4).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 8 to 15 inches
Depth to the water table: 24 to 42 inches from May through July
Percent of surface covered by boulders: 0.01 to 0.1 percent

A horizon:
Hue—10YR, 2.5Y, or N
Value—2, 3, or 4 dry; 2 or 3 moist
Chroma—0, 1, or 2
Texture—loam, mucky silt loam, or mucky loam
Clay content—15 to 27 percent
Content of rock fragments—10 to 40 percent (0 to 15 percent cobbles, stones, or boulders; 10 to 35 percent pebbles)
Reaction—pH 6.1 to 7.3

Bw1 and Bw2 horizons:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2 or 3
Texture—silt loam, clay loam, sandy clay loam, or loam
Clay content—18 to 30 percent
Content of rock fragments—15 to 50 percent (0 to 15 percent cobbles, stones, or boulders; 15 to 40 percent pebbles)
Reaction—pH 6.6 to 7.3

Bw3 horizon:
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2 or 3
Texture—loam, clay loam, or sandy clay loam
Clay content—18 to 30 percent
Content of rock fragments—35 to 60 percent (0 to 10 percent cobbles and stones, 30 to 50 percent pebbles)
Reaction—pH 6.6 to 7.3

BC horizon:
Value—6 or 7 dry; 5 or 6 moist
Chroma—2, 3, or 4
Texture—loam or sandy clay loam
Clay content—18 to 27 percent
Content of rock fragments—35 to 60 percent (0 to 10 percent cobbles, 35 to 50 percent pebbles)
Reaction—pH 6.6 to 7.8

Tigeron Family

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, ridges, saddles, and side slopes of mountains
Parent material: Colluvium and slope alluvium derived mainly from fine grained igneous and metamorphic rocks
Slope range: 2 to 70 percent slopes
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 40 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Eutric Haplocryalfs

Typical Pedon

Tigeron very cobbly loam, in an area of Tigeron, very bouldery-Redfern, bouldery-Rock outcrop complex, 15 to 45 percent slopes, warm; in a forested area, 1,050 feet south and 2,400 feet east of the northwest corner of sec. 5, T. 5 N., R. 3 W.

Oe—2 inches to 0; forest litter of undecomposed and decomposed needles, twigs, and cones.
A—0 to 2 inches; grayish brown (2.5Y 5/2) very cobbly loam, very dark grayish brown (2.5Y 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; 20 percent cobbles and 35 percent pebbles; neutral (pH 7.2); clear smooth boundary.
E1—2 to 8 inches; light brownish gray (2.5Y 6/2) extremely cobbly loam, grayish brown (2.5Y 5/2) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and common medium and coarse roots; many very fine and fine pores; 25 percent cobbles and 40 percent pebbles; neutral (pH 6.8); clear wavy boundary.
E2—8 to 19 inches; light gray (10YR 7/1) extremely gravelly loam, pale brown (10YR 6/3) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; 15 percent cobbles and 50 percent pebbles; slightly acid (pH 6.1); clear wavy boundary.
Bt1—19 to 36 inches; light yellowish brown (2.5Y 6/4) extremely gravelly clay loam, light olive brown (2.5Y 5/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, moderately sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; many distinct clay films on faces of peds and bridging sand grains; 15 percent cobbles and 50 percent pebbles; neutral (pH 6.9); gradual wavy boundary.
Bt2—36 to 60 inches; pale brown (10YR 6/3) extremely cobbly sandy clay loam, yellowish brown (10YR 5/4) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots and few medium and coarse roots; many

very fine pores; common distinct clay films on faces of peds and bridging sand grains; 30 percent cobbles and 50 percent pebbles; slightly acid (pH 6.2).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 10 to 24 inches
Percent of surface covered by stones/boulders: 0.01 to 3.0 percent

A horizon:
Hue—2.5Y, 10YR, or 7.5YR
Value—4 or 5 dry; 3 or 4 moist
Chroma—1, 2, or 3
Clay content—15 to 25 percent
Content of rock fragments—35 to 70 percent (15 to 40 percent cobbles and stones, 20 to 40 percent pebbles)
Reaction—pH 5.6 to 7.3

E horizon:
Hue—2.5Y, 10YR, or 7.5YR
Value—6 or 7 dry; 4, 5, or 6 moist
Chroma—1, 2, or 3
Clay content—15 to 25 percent
Content of rock fragments—35 to 70 percent (15 to 40 percent cobbles and stones, 20 to 50 percent pebbles)
Reaction—pH 5.6 to 7.3

Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—loam, clay loam, or sandy clay loam
Clay content—18 to 35 percent
Content of rock fragments—35 to 80 percent (10 to 30 percent cobbles and stones, 15 to 50 percent pebbles)
Reaction—pH 5.6 to 7.3

Tineman Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Moraines, valleys, and side slopes of mountains
Parent material: Gravelly and cobbly alluvium derived from mixed rock sources
Slope range: 2 to 25 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Ustic Haplocryolls

Typical Pedon

Tineman gravelly loam, in an area of Tineman, very stony-Franconi, bouldery-Rock outcrop complex, 4 to 25 percent slopes; in a forested area, 1,650 feet west and 2,475 feet north of the southeast corner of sec. 19, T. 4 N., R. 3 W.

A1—0 to 3 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, friable, nonsticky and nonplastic; many fine and very fine, common medium, and few coarse roots; 5 percent rounded cobbles and 20 percent rounded pebbles; neutral (pH 6.6); clear wavy boundary.
A2—3 to 9 inches; brown (10YR 4/3) gravelly loam, dark brown (10YR 3/3) moist; moderate medium granular structure; slightly hard, friable, slightly sticky and nonplastic; many fine and very fine, common medium, and few coarse roots; 5 percent rounded cobbles and 15 percent rounded pebbles; neutral (pH 6.6); clear wavy boundary.
Bw1—9 to 25 inches; brown (10YR 5/3) extremely gravelly sandy loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common fine and very fine roots; 20 percent rounded cobbles and 50 percent rounded pebbles; neutral (pH 6.8); gradual wavy boundary.
Bw2—25 to 30 inches; light olive brown (2.5Y 5/4) gravelly sandy loam, dark brown (10YR 3/3) moist; weak medium prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; few very fine roots; 10 percent rounded cobbles and 25 percent rounded pebbles; neutral (pH 7.2); gradual wavy boundary.
2C—30 to 60 inches; brown (10YR 5/3) very gravelly loamy coarse sand, dark brown (10YR 3/3) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 10 percent rounded cobbles and 45 percent rounded pebbles; slightly alkaline (pH 7.4).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Thickness of the mollic epipedon: 9 to 15 inches

Percent of surface covered by stones/boulders: 0.1 to 3.0 percent

A horizon:
Value—3 or 4 dry; 2 or 3 moist
Chroma—2 or 3
Clay content—15 to 27 percent
Content of rock fragments—15 to 35 percent (5 to 15 percent cobbles, 10 to 20 percent pebbles)
Reaction—pH 6.1 to 7.3

Bw1 horizon:
Hue—10YR or 7.5YR
Value—5 or 6 dry; 3 or 4 moist
Chroma—3, 4, or 6
Texture—loam, fine sandy loam, or sandy loam
Clay content—15 to 27 percent
Content of rock fragments—35 to 75 percent (10 to 25 percent cobbles, 25 to 50 percent pebbles)
Reaction—pH 6.1 to 7.3

Bw2 horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 3 or 4 moist
Chroma—3, 4, or 6
Clay content—5 to 15 percent
Content of rock fragments—35 to 60 percent (10 to 20 percent cobbles, 25 to 45 percent pebbles)
Reaction—pH 6.1 to 7.3

2C horizon:
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—3, 4, or 6
Texture—coarse sand or loamy coarse sand
Clay content—5 to 15 percent
Content of rock fragments—35 to 70 percent (10 to 25 percent cobbles and stones, 25 to 45 percent pebbles)
Reaction—pH 6.6 to 7.8

Tolbert Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, interfluves, and side slopes of hills
Parent material: Residuum derived from hard, fine grained sandstone or igneous rock
Slope range: 8 to 70 percent
Elevation range: 3,600 to 6,200 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Lithic Argiustolls

Typical Pedon

Tolbert very cobbly loam, in an area of Shawmut, bouldery-Shawmut, stony-Tolbert, bouldery, complex, 15 to 35 percent slopes, in rangeland, 300 feet north and 2,600 feet east of the southwest corner of sec. 4, T. 5 N., R. 3 W.

A—0 to 7 inches; dark grayish brown (10YR 4/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; 30 percent angular cobbles and 10 percent angular pebbles; neutral (pH 6.6); clear wavy boundary.
Bt—7 to 12 inches; brown (10YR 5/3) very cobbly clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; many very fine and fine roots; many very fine and fine pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds and bridging sand grains; 40 percent angular cobbles and 15 percent angular pebbles; neutral (pH 6.8); abrupt smooth boundary.
R—12 inches; hard, fine grained igneous rock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)
Thickness of the mollic epipedon: 7 to 10 inches
Depth to Bt horizon: 5 to 8 inches
Depth to bedrock: 10 to 20 inches
Percent of surface covered by stones/boulders: 0.01 to 3.0 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Clay content—15 to 27 percent
Content of rock fragments—15 to 60 percent (0 to 10 percent stones, 10 to 30 percent cobbles, 5 to 25 percent pebbles)
Reaction—pH 6.6 to 7.3

Bt horizon:
Hue—10YR or 2.5Y

Value—4 or 5 dry; 3 or 4 moist
Chroma—2, 3, or 4
Texture—loam or clay loam
Clay content—23 to 35 percent
Content of rock fragments—35 to 80 percent (0 to 5 percent stones, 20 to 45 percent cobbles, 15 to 30 percent pebbles)
Reaction—pH 6.6 to 7.3

Torpy Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans and side slopes of mountains
Parent material: Slope alluvium and colluvium derived from tuffaceous volcanic rocks
Slope range: 4 to 60 percent
Elevation range: 5,500 to 8,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 30 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Vitrandic Eutrocryepts

Typical Pedon

Torpy gravelly loam, 15 to 35 percent slopes, in a forested area, 2,600 feet east and 200 feet south of the northwest corner of sec. 19, T. 6 N., R. 6 W.

Oi—1 inch to 0; forest litter of partially decomposed needles and twigs.
A—0 to 3 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate thin platy structure; soft, very friable, nonsticky and slightly plastic; common very fine and fine roots; common very fine and fine pores; 15 percent welded tuff pebbles; moderately acid (pH 6.0); clear smooth boundary.
E—3 to 8 inches; light brownish gray (10YR 6/2) loam, grayish brown (10YR 5/2) moist; weak medium granular structure; soft, very friable, slightly sticky and moderately plastic; common very fine and fine roots; common very fine and fine pores; 10 percent welded tuff pebbles; slightly acid (pH 6.2); gradual smooth boundary.
Bw—8 to 34 inches; light gray (10YR 7/2) very cobbly loam, grayish brown (10YR 5/2) moist; moderate medium angular blocky structure; soft, very friable, slightly sticky and moderately plastic; common very fine and few fine roots; common very fine and fine pores; 20 percent welded tuff cobbles and 20 percent welded tuff pebbles; slightly acid (pH 6.4); gradual smooth boundary.
BC—34 to 60 inches; light gray (10YR 7/1) very cobbly loam, gray (10YR 5/1) moist; single grain; loose, slightly sticky and slightly plastic; few coarse roots; 25 percent welded tuff cobbles and 25 percent welded tuff pebbles; slightly acid (pH 6.5).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 8 and 24 inches
Content of volcanic glass: More than 30 percent in the coarse silt and sand fraction of one or more horizons
Percent of surface covered by stones/boulders: 0 to 20 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 2 or 3 moist
Chroma—1 or 2
Clay content—12 to 23 percent
Content of rock fragments—5 to 35 percent (0 to 20 percent stones and cobbles, 5 to 20 percent pebbles)
Reaction—pH 5.6 to 7.3

E horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 3, 4, or 5 moist
Chroma—1 or 2
Texture—loam or sandy loam
Clay content—12 to 20 percent
Content of rock fragments—0 to 35 percent (0 to 20 percent stones and cobbles, 0 to 15 percent pebbles)
Reaction—pH 5.6 to 7.3

Bw horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 4 or 5 moist
Chroma—1 or 2
Texture—loam or sandy loam
Clay content—12 to 18 percent
Content of rock fragments—35 to 60 percent (15 to 35 percent stones and cobbles, 20 to 25 percent pebbles)
Reaction—pH 5.6 to 7.3

BC horizon:
Hue—10YR or 2.5Y
Value—7 or 8 dry; 5 or 6 moist
Chroma—1 or 2
Texture—loam, sandy loam, or loamy sand

Clay content—5 to 15 percent
Content of rock fragments—35 to 70 percent (15 to 45 percent stones and cobbles, 20 to 25 percent pebbles)
Reaction—pH 6.1 to 7.8

Tropal Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Ridges and side slopes of mountains
Parent material: Residuum derived from limestone
Slope range: 4 to 70 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, carbonatic Lithic Eutrocryepts

Typical Pedon

Tropal very gravelly loam, in an area of Tropal, bouldery-Rock outcrop-Whitore, bouldery, complex, 15 to 45 percent slopes; in a forested area, 700 feet west and 1,800 feet north of the southeast corner of sec. 3, T. 5 N., R. 2 W.

Oi—1/2 inch to 0; partially decomposed needles, twigs, and leaves.
A—0 to 4 inches; brown (10YR 5/3) very gravelly loam, dark grayish brown (10YR 4/2) moist; moderate medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine roots; 5 percent cobbles and 40 percent angular pebbles; disseminated lime, continuous distinct lime coatings on underside of fragments; violently effervescent; moderately alkaline (pH 8.2); abrupt smooth boundary.
Bk—4 to 16 inches; light gray (10YR 7/2) very gravelly loam, grayish brown (10YR 5/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; common very fine and fine pores; 10 percent cobbles and 50 percent angular pebbles; disseminated lime, common fine and medium threads and masses of lime, continuous prominent lime casts on fragments; violently effervescent; moderately alkaline (pH 8.4); clear wavy boundary.
R—16 inches; light gray (10YR 7/1), hard limestone.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)
Depth to bedrock: 10 to 20 inches
Percent of surface covered by stones/boulders: 0.01 to 3.0 percent

A horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Clay content—15 to 25 percent
Content of rock fragments—15 to 60 percent (0 to 15 percent stones and cobbles, 15 to 45 percent pebbles)
Calcium carbonate equivalent—0 to 15 percent
Reaction—pH 7.4 to 8.4

Bk horizon:
Hue—10YR or 2.5Y
Value—5, 6, 7, or 8 dry; 5, 6, or 7 moist
Chroma—2 or 3
Clay content—10 to 20 percent
Content of rock fragments—35 to 80 percent (10 to 20 percent cobbles and stones, 25 to 60 percent pebbles)
Calcium carbonate equivalent—40 to 60 percent
Reaction—pH 7.4 to 9.0

Trudau Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Alluvial fans, stream terraces, flood-plain steps, and knolls
Parent material: Alluvium
Slope range: 0 to 15 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Aridic Haplustepts

Typical Pedon

Trudau loam, 2 to 8 percent slopes, in rangeland, 1,200 feet north and 1,200 feet west of the southeast

corner of sec. 22, T. 8 S., R. 5 W., Madison County, Montana:

A—0 to 2 inches; light gray (10YR 7/2) loam, grayish brown (10YR 5/2) moist; weak very thin platy structure parting to moderate very fine granular; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine tubular pores; strongly effervescent; strongly alkaline (pH 8.6); abrupt smooth boundary.

Bw—2 to 14 inches; light gray (10YR 7/2) loam, light brownish gray (10YR 6/2) moist; weak coarse prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots; many very fine irregular and tubular pores; few fine masses of lime; strongly effervescent; strongly alkaline (pH 8.6); gradual smooth boundary.

Bk—14 to 30 inches; very pale brown (10YR 7/3) loam, pale brown (10YR 6/3) moist; weak coarse prismatic structure parting to weak medium subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots; many irregular and tubular pores; common fine and medium masses of lime; strongly effervescent; strongly alkaline (pH 8.6); clear wavy boundary.

Bkz—30 to 60 inches; very pale brown (10YR 7/3) loam stratified with sandy loam, pale brown (10YR 6/3) moist; massive; soft, very friable, slightly sticky and nonplastic; few fine roots; many irregular pores; common fine salt crystals; common fine and medium masses of lime; violently effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 40 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bk horizon: 10 to 23 inches
Depth to Bkz horizon: 15 to 40 inches

A horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 3, 4, or 5 moist
Chroma—2 or 3
Texture—loam, silt loam, or clay loam
Clay content—20 to 30 percent
Content of rock fragments—0 to 5 percent pebbles
Calcium carbonate equivalent—5 to 10 percent
Reaction—pH 8.5 to 9.0

Bw horizon:
Hue—10YR or 2.5Y
Value—6, 7, or 8 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—loam or clay loam
Clay content—20 to 35 percent
Content of rock fragments—0 to 5 percent pebbles
Electrical conductivity—4 to 16 mmhos/cm
Sodium adsorption ratio—1 to 5
Calcium carbonate equivalent—5 to 10 percent
Reaction—pH 8.5 to 9.0

Bk horizon:
Hue—10YR or 2.5Y
Value—6, 7, or 8 dry; 5, 6, or 7 moist
Chroma—2 or 3
Texture—loam or clay loam
Clay content—20 to 35 percent
Content of rock fragments—0 to 15 percent pebbles
Electrical conductivity—4 to 16 mmhos/cm
Sodium adsorption ratio—2 to 15
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 8.5 to 9.0

Bkz horizon:
Hue—10YR or 2.5Y
Value—6, 7, or 8 dry; 5, 6, or 7 moist
Chroma—2, 3, or 4
Texture—loam or clay loam
Clay content—18 to 35 percent
Content of rock fragments—0 to 15 percent (0 to 5 percent cobbles, 0 to 10 percent pebbles)
Electrical conductivity—4 to 16 mmhos/cm
Sodium adsorption ratio—2 to 15
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 8.5 to 9.0

Tuggle Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of mountains
Parent material: Residuum or slope alluvium derived from granite
Slope range: 2 to 60 percent
Elevation range: 5,500 to 8,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy, mixed, superactive Lithic Haplocryolls

Typical Pedon

Tuggle very cobbly coarse sandy loam, in an area of Opitz, bouldery-Branham, very bouldery-Tuggle, very bouldery, complex, 8 to 35 percent slopes, in rangeland, 900 feet east and 500 feet south of the northwest corner of sec. 5, T. 3 N., R. 3 W.

A—0 to 7 inches; dark brown (10YR 3/3) very cobbly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and common medium roots; 20 percent cobbles and 35 percent granite pebbles; neutral (pH 7.2); clear wavy boundary.

Bw—7 to 11 inches; brown (10YR 4/3) gravelly coarse sandy loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots and common medium roots; many very fine and few fine pores; 20 percent granite pebbles; neutral (pH 7.3); clear wavy boundary.

BC—11 to 15 inches; brown (10YR 5/3) gravelly coarse sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, common fine, and few medium roots; many very fine and few fine pores; 25 percent granite pebbles; neutral (pH 7.3); gradual wavy boundary.

Cr—15 to 18 inches; light brownish gray (10YR 6/2), decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand.

R—18 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between a depth of 8 inches and the lithic contact
Thickness of the mollic epipedon: 7 to 10 inches
Depth to Cr horizon: 10 to 19 inches
Depth to R layer: 12 to 20 inches
Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
Hue—10YR or 2.5Y
Value—3, 4, or 5 dry; 2 or 3 moist
Chroma—1, 2, or 3
Clay content—10 to 18 percent
Content of rock fragments—5 to 60 percent (5 to 45 percent pebbles, 0 to 20 percent cobbles, 0 to 5 percent stones)
Reaction—pH 5.6 to 7.3

Bw horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2 or 3
Texture—coarse sandy loam or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—5 to 25 percent pebbles (mainly less than 7 mm in diameter)
Reaction—pH 6.1 to 7.3

BC horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—coarse sandy loam or sandy loam
Clay content—10 to 18 percent
Content of rock fragments—10 to 35 percent pebbles (mainly less than 10 mm in diameter)
Reaction—pH 6.1 to 7.3

Udecide Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Knolls, interfluves, and side slopes of hills
Parent material: Slope alluvium or residuum derived from weakly consolidated siltstone, loamstone, and sandstone
Slope range: 2 to 15 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Aridic Argiustolls

Typical Pedon

Udecide sandy clay loam, in an area of Udecide-Varney-Walbert complex, 4 to 25 percent slopes, in rangeland, 2,100 feet north and 2,600 feet east of the southwest corner of sec. 29, T. 2 N., R. 1 W.

A—0 to 5 inches; grayish brown (10YR 5/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and

nonplastic; many very fine and fine roots; many very fine and fine pores; 5 percent rounded pebbles; neutral (pH 7.0); clear wavy boundary.

Bt1—5 to 9 inches; dark grayish brown (10YR 4/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; common distinct dark brown (10YR 3/3) clay films on faces of peds and bridging sand grains; 5 percent rounded pebbles; neutral (pH 7.2); clear wavy boundary.

Bt2—9 to 14 inches; grayish brown (10YR 5/2) loam, dark grayish brown (10YR 4/2) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; common distinct dark brown (10YR 3/3) clay films on faces of peds and bridging sand grains; 5 percent rounded pebbles; neutral (pH 7.2); gradual wavy boundary.

Bk1—14 to 20 inches; light brownish gray (10YR 6/2) gravelly loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; 15 percent rounded pebbles; disseminated lime, common fine masses and threads of lime, few faint light gray (10YR 7/1) lime coatings on undersides of pebbles; strongly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

Bk2—20 to 28 inches; light brownish gray (10YR 6/2) gravelly sandy clay loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine and fine pores; 15 percent rounded pebbles; disseminated lime, common medium masses and threads of lime, common distinct lime coatings on undersides of pebbles; violently effervescent; slightly alkaline (pH 7.8); clear smooth boundary.

Cr—28 to 60 inches; light brownish gray (2.5Y 6/2), weakly consolidated sandstone that crushes to loamy sand.

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 10 inches
Depth to Bt horizon: 4 to 8 inches
Depth to Bk horizon: 10 to 23 inches
Depth to Cr horizon: 20 to 40 inches

A horizon:
- Hue—10YR or 2.5Y
- Value—2 or 3 moist
- Chroma—2 or 3
- Clay content—20 to 30 percent
- Content of rock fragments—0 to 15 percent pebbles
- Reaction—pH 6.6 to 7.8

Bt horizon:
- Hue—7.5YR, 10YR, or 2.5Y
- Value—4, 5, or 6 dry; 3 or 4 moist
- Chroma—2 or 3
- Texture—loam, clay loam, or sandy clay loam
- Clay content—23 to 35 percent
- Content of rock fragments—0 to 15 percent pebbles
- Reaction—pH 6.6 to 7.8

Bk horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—loam, sandy loam, or sandy clay loam
- Clay content—10 to 25 percent
- Content of rock fragments—5 to 25 percent pebbles
- Calcium carbonate equivalent—10 to 20 percent
- Reaction—pH 7.9 to 8.4

Varney Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, stream terraces, knolls, and side slopes of hills
Parent material: Slope alluvium derived from mixed rock sources
Slope range: 0 to 35 percent
Elevation range: 3,800 to 5,200 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Calcidic Argiustolls

Typical Pedon

Varney sandy clay loam, 2 to 8 percent slopes, in cropland, 1,200 feet north and 2,100 feet west of the southeast corner of sec. 19, T. 2 N., R. 1 W.

Ap—0 to 6 inches; grayish brown (2.5Y 5/2) sandy clay loam, very dark grayish brown (2.5Y 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 5 percent rounded pebbles; neutral (pH 7.0); abrupt smooth boundary.

Bt1—6 to 12 inches; dark grayish brown (10YR 4/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine pores; continuous faint clay films on faces of peds and bridging sand grains; 5 percent rounded pebbles; neutral (pH 7.0); clear wavy boundary.

Bt2—12 to 18 inches; brown (10YR 5/3) sandy clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine pores; common distinct dark grayish brown (10YR 4/2) (moist) clay films on faces of peds and bridging sand grains; 5 percent rounded pebbles; neutral (pH 7.2); clear wavy boundary.

Bk1—18 to 24 inches; light yellowish brown (2.5Y 6/4) sandy clay loam, brown (10YR 5/3) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine pores; 5 percent rounded pebbles; disseminated lime, few fine and medium threads and masses of lime, common faint lime coatings on undersides of fragments; strongly effervescent; slightly alkaline (pH 7.8); clear wavy boundary.

Bk2—24 to 33 inches; light yellowish brown (2.5Y 6/4) sandy loam, light olive brown (2.5Y 5/4) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine pores; 5 percent rounded pebbles; disseminated lime, common fine and medium threads and masses of lime, common faint lime coatings on fragments; violently effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.

BC—33 to 60 inches; light yellowish brown (2.5Y 6/4) sandy clay loam consisting of stratified sandy loam, sandy clay loam, and loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine roots; few fine pores; 10 percent rounded pebbles; disseminated lime; slightly effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 16 inches
Depth to Bt horizon: 5 to 11 inches
Depth to Bk horizon: 13 to 20 inches
Percent of surface covered by stones: 0 to 0.1 percent

Ap horizon:
- Hue—10YR or 2.5Y
- Value—4 or 5 dry; 2 or 3 moist
- Chroma—2 or 3
- Texture—clay loam, loam, or sandy clay loam
- Clay content—18 to 35 percent
- Content of rock fragments—0 to 35 percent (0 to 15 percent cobbles, 0 to 20 percent pebbles)
- Reaction—pH 6.6 to 7.8

Bt horizon:
- Hue—10YR or 2.5Y
- Value—4, 5, or 6 dry; 3, 4, or 5 moist
- Chroma—2, 3, or 4
- Texture—clay loam or sandy clay loam
- Clay content—27 to 35 percent
- Content of rock fragments—5 to 35 percent (0 to 10 percent cobbles, 5 to 30 percent pebbles)
- Reaction—pH 6.6 to 7.8

Bk horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, 7, or 8 dry; 4, 5, 6, or 7 moist
- Chroma—2, 3, or 4
- Texture—sandy loam, loam, clay loam, or sandy clay loam
- Clay content—10 to 30 percent
- Content of rock fragments—5 to 35 percent (0 to 5 percent cobbles, 5 to 30 percent pebbles)
- Calcium carbonate equivalent—15 to 30 percent
- Reaction—pH 7.4 to 8.4

BC horizon:
- Hue—2.5Y, 10YR, or 7.5YR
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—sandy clay loam or sandy loam consisting of stratified sandy clay loam, sandy loam, loam, and clay loam
- Clay content—5 to 20 percent
- Content of rock fragments—5 to 35 percent (0 to 5 percent cobbles, 5 to 30 percent pebbles)

Calcium carbonate equivalent—10 to 25 percent
Reaction—pH 7.9 to 8.4

Vendome Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour) above the 2Bk horizon and rapid (6.0 to 20.0 inches per hour) in the 2Bk horizon
Landform: Alluvial fans, stream terraces, knolls, and plains
Parent material: Gravelly and cobbly alluvium derived from mixed rock sources
Slope range: 0 to 25 percent
Elevation range: 4,000 to 5,500 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Sandy-skeletal, mixed, frigid Aridic Haplustolls

Typical Pedon

Vendome sandy loam, 0 to 8 percent slopes, in rangeland, 750 feet south and 210 feet west of the northeast corner of sec. 15, T. 1 S., R. 5 W.

A—0 to 6 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; moderate fine granular structure; slightly hard, friable, nonsticky and nonplastic; many very fine and fine roots; 5 percent rounded pebbles; neutral (pH 7.2); clear smooth boundary.

Bw—6 to 12 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; weak medium prismatic structure parting to moderate fine and medium subangular blocky; slightly hard, friable, nonsticky and nonplastic; common very fine and fine roots; 5 percent rounded pebbles; neutral (pH 7.2); gradual wavy boundary.

Bk1—12 to 18 inches; pale brown (10YR 6/3) cobbly sandy loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; 20 percent rounded cobbles and 5 percent rounded pebbles; disseminated lime, many faint lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.4); gradual wavy boundary.

2Bk2—18 to 30 inches; light brownish gray (10YR 6/2) extremely cobbly loamy sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 35 percent rounded cobbles and 40 percent rounded pebbles; disseminated lime, many distinct lime coatings around pebbles; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

2Bk3—30 to 60 inches; light brownish gray (10YR 6/2) extremely gravelly loamy sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 15 percent rounded cobbles and 60 percent rounded pebbles; few faint lime coatings around fragments in the upper 12 inches; violently effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 12 and 35 inches
Thickness of the mollic epipedon: 7 to 12 inches
Depth to Bk1 horizon: 10 to 18 inches
Depth to 2Bk material: 13 to 22 inches
Percent of surface covered by stones: 0 to 3 percent

A horizon:
Hue—4 or 5 dry
Chroma—2 or 3
Texture—sandy loam or loam
Clay content—10 to 20 percent
Content of rock fragments—0 to 60 percent (0 to 25 percent cobbles, 0 to 35 percent pebbles)
Reaction—pH 6.6 to 7.8

Bw horizon:
Value—4, 5, or 6 dry; 3 or 4 moist
Chroma—2 or 3
Clay content—5 to 15 percent
Content of rock fragments—0 to 70 percent (0 to 30 percent cobbles, 0 to 40 percent pebbles)
Reaction—pH 6.6 to 8.4

Bk horizon:
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—sandy loam or loamy sand
Clay content—0 to 10 percent
Content of rock fragments—5 to 75 percent (0 to 35 percent cobbles and stones, 5 to 40 percent pebbles)
Calcium carbonate equivalent—5 to 25 percent
Reaction—pH 7.4 to 8.4

2Bk horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—loamy sand or loamy coarse sand
Clay content—0 to 10 percent

Content of rock fragments—35 to 85 percent (0 to 35 percent cobbles and stones, 30 to 60 percent pebbles)
Calcium carbonate equivalent—5 to 25 percent
Reaction—pH 7.4 to 8.4

Vigilante Series

Depth class: Deep (40 to 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, escarpments, ridges, interfluves, and side slopes of hills
Parent material: Local colluvium or slope alluvium deposited over hard, highly fractured shale or argillite bedrock
Slope range: 8 to 50 percent
Elevation range: 4,400 to 6,500 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 38 to 42 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Haplustolls

Typical Pedon

Vigilante channery loam, in an area of Wilde-Deville-Vigilante complex, 8 to 35 percent slopes, in rangeland, 800 feet south and 2,675 feet west of the northeast corner of sec. 19, T. 2 N., R. 3 W.

A—0 to 7 inches; brown (7.5YR 4/2) channery loam, dark brown (7.5YR 3/2) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 25 percent channers; slightly alkaline (pH 7.4); clear wavy boundary.
Bw1—7 to 16 inches; brown (10YR 5/3) very channery loam, brown (7.5YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and few medium roots; common very fine and fine pores; 5 percent flagstones and 50 percent channers; neutral (pH 7.2); gradual wavy boundary.
Bw2—16 to 34 inches; pale brown (10YR 6/3) extremely channery loam, brown (10YR 4/3) moist; weak coarse subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and few medium roots; common medium pores; 5 percent flagstones and 65 percent channers; neutral (pH 7.0); gradual irregular boundary.
BC—34 to 46 inches; very pale brown (10YR 7/3) extremely channery loam, yellowish brown (10YR 5/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine roots; common fine pores; 10 percent flagstones and 70 percent channers; neutral (pH 7.0); gradual wavy boundary.
R—46 inches; hard, pale brown (10YR 6/3), highly fractured shale.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 11 inches
Depth to bedrock: 40 to 60 inches

A horizon:
Hue—7.5YR or 10YR
Value—4 or 5 dry
Chroma—2 or 3
Clay content—15 to 27 percent
Content of rock fragments—15 to 35 percent (0 to 10 percent flagstones, 15 to 25 percent channers)
Reaction—pH 6.6 to 7.8

Bw1 horizon:
Hue—7.5YR or 10YR
Value—5 or 6 dry; 4 or 5 moist
Chroma—2 or 3
Clay content—18 to 27 percent
Content of rock fragments—25 to 60 percent (0 to 10 percent flagstones, 25 to 50 percent channers)
Reaction—pH 6.6 to 7.8

Bw2 horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist:
Chroma—2, 3, or 4
Texture—loam or sandy loam
Clay content—18 to 27 percent
Content of rock fragments—35 to 75 percent (0 to 10 percent flagstones, 35 to 65 percent channers)
Reaction—pH 6.6 to 7.8

BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—loam or sandy loam
Clay content—10 to 15 percent
Content of rock fragments—35 to 85 percent (5 to 15 percent flagstones, 30 to 70 percent channers)

Reaction—pH 6.6 to 7.8

Villy Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Poorly drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Flood plains, flood-plain steps, and drainageways
Parent material: Alluvium
Slope range: 0 to 2 percent
Elevation range: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Taxonomic classification: Fine-silty, mixed, superactive, calcareous, frigid Typic Fluvaquents

Typical Pedon

Villy silt loam, 0 to 2 percent slopes, in pasture; 2,500 feet south and 1,300 feet west of the northeast corner of sec. 4, T. 10 N., R. 3 W., Lewis and Clark County, Montana:

A—0 to 2 inches; dark grayish brown (10YR 3/2) silt loam, gray (10YR 6/1) dry; moderate thin platy structure; slightly hard, very friable, slightly sticky and nonplastic; disseminated lime; violently effervescent; moderately alkaline; gradual smooth boundary.

Bg1—2 to 9 inches; dark gray (10YR 4/1) silt loam, gray (10YR 6/1) dry; moderate thin platy structure parting to moderate very fine and fine granular; slightly hard, friable, sticky and slightly plastic; many very fine roots; many very fine tubular and interstitial pores; disseminated lime; violently effervescent; moderately alkaline; gradual smooth boundary.

Bg2—9 to 28 inches; black (10YR 2/1) silt loam, dark gray (10YR 4/1) dry; moderate medium and coarse subangular blocky structure parting to moderate fine granular; slightly hard, friable, sticky and slightly plastic; common fine roots; many very fine tubular and interstitial pores; few fine seams and soft masses of salt crystals; disseminated lime; violently effervescent; moderately alkaline; gradual smooth boundary.

Bkg—28 to 50 inches; dark gray (5Y 4/1) silt loam, gray (5Y 6/1) dry; common fine prominent dark brown (7.5YR 4/2) (moist) redox depletions; moderate very thin platy structure; hard, friable, sticky and plastic; common very fine roots; many very fine tubular and interstitial pores; disseminated lime, common fine soft masses and threads of lime; strongly effervescent; moderately alkaline; gradual smooth boundary.

Cg—50 to 60 inches; dark grayish brown (2.5Y 4/2) loam, light brownish gray (2.5Y 6/2) dry; common fine prominent olive gray (5Y 4/2) (moist) redox depletions; massive; hard, friable, slightly sticky and slightly plastic; few very fine roots; slightly effervescent; moderately alkaline.

Range in Characteristics

Soil temperature: 40 to 47 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Water table: At the surface to 24 inches below the surface

A horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 3, 4, or 5 moist
Chroma—1 or 2
Clay content—18 to 27 percent
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 8.4

Bg horizon:
Hue—10YR, 2.5Y, or N
Value—4, 5, or 6 dry; 3 or 4 moist
Chroma—0, 1, 2, or 3
Texture—silt loam or silty clay loam
Clay content—18 to 35 percent
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 8.4

Cg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—6, 7, or 8 dry; 4, 5, or 6 moist
Chroma—0, 1, or 2
Texture—silt loam, silty clay loam, or very fine sandy loam; thin strata of loam, silt, and sandy loam
Clay content—18 to 35 percent
Redoximorphic features—7.5YR 4/2, 4/4; 5Y 4/2, 4/3
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 8.4

Vitroff Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)

Landform: Alluvial fans, saddles, and side slopes of mountains
Parent material: Colluvium or slope alluvium derived from tuffaceous volcanic bedrock
Slope range: 4 to 60 percent
Elevation range: 5,500 to 7,000 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Fine-loamy, mixed, superactive Vitrandic Haplocryalfs

Typical Pedon

Vitroff loam, in an area of Vitroff-Torpy loams, 35 to 60 percent slopes; in a forested area, 800 feet east and 450 feet north of the southwest corner of sec. 22, T. 6 N., R. 6 W.

Oi—1 inch to 0; forest litter of slightly decomposed needles, twigs, and roots.
E1—0 to 2 inches; light brownish gray (10YR 6/2) loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common coarse, medium, fine, and very fine roots; 2 percent angular welded tuff pebbles; slightly acid (pH 6.2); clear smooth boundary.
E2—2 to 7 inches; very pale brown (10YR 7/3) loam, dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; common coarse, medium, fine, and very fine roots; 10 percent angular welded tuff pebbles; neutral (pH 6.6); clear smooth boundary.
Bt and E—7 to 14 inches; 65 percent lamellae (1/2 to 5/8 inch thick) of brown (10YR 4/3) gravelly clay loam, very dark grayish brown (2.5Y 3/2) moist (Bt part); 35 percent very pale brown (10YR 7/3) sandy clay loam, dark grayish brown (2.5Y 4/2) moist (E part); weak medium subangular blocky structure; hard, firm, moderately sticky and moderately plastic (Bt part); slightly hard, friable, slightly sticky and slightly plastic (E part); few coarse roots and common medium, fine, and very fine roots; few fine and common very fine pores; 5 percent angular welded tuff cobbles and 20 percent welded tuff pebbles; neutral (pH 6.8); gradual wavy boundary.
Bt—14 to 32 inches; pale brown (10YR 6/3) gravelly clay loam, dark grayish brown (2.5Y 4/2) moist; weak medium subangular blocky structure; very hard, firm, moderately sticky and moderately plastic; few medium and fine roots and common very fine roots; few fine and common very fine pores; common faint clay films on faces of peds and bridging sand grains; 10 percent angular welded tuff cobbles and 20 percent angular welded tuff pebbles; neutral (pH 7.2); diffuse wavy boundary.
BC—32 to 60 inches; light gray (10YR 7/2) extremely gravelly coarse sandy loam, olive brown (2.5Y 4/3) moist; massive; loose, nonsticky and nonplastic; few fine and very fine roots in the upper 2 feet; 20 percent angular welded tuff cobbles and 50 percent angular welded tuff pebbles; slightly alkaline (pH 7.4).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to lamellae: 6 to 20 inches
Content of volcanic glass: More than 30 percent in the coarse silt and sand fraction of one or more horizons

E horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 3 or 4 moist
Chroma—2 or 3
Clay content—18 to 27 percent
Content of rock fragments—0 to 15 percent (0 to 5 percent angular cobbles, 0 to 10 percent pebbles)
Reaction—pH 5.6 to 7.3

Bt and E horizon:
Hue—10YR or 2.5Y
Value—4 or 5 dry, 3 or 4 moist (Bt part); 5, 6, or 7 dry, 4 or 5 moist (E part)
Chroma—2 or 3
Texture—clay loam or sandy clay loam (Bt part); sandy clay loam or sandy loam (E part)
Clay content—20 to 35 percent (Bt part); 15 to 24 percent (E part)
Content of rock fragments—5 to 35 percent (0 to 5 percent angular cobbles, 5 to 30 percent pebbles)
Reaction—pH 6.1 to 7.3

Bt horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2 or 3
Texture—clay loam or sandy clay loam
Clay content—25 to 35 percent
Content of rock fragments—10 to 35 percent (0 to 10 percent angular cobbles, 10 to 25 percent pebbles)
Reaction—pH 6.1 to 7.3

BC horizon:
Hue—10YR or 2.5Y
Value—6 or 7 dry; 4 or 5 moist
Chroma—2, 3, or 4
Clay content—5 to 15 percent
Content of rock fragments—35 to 85 percent (5 to 20 percent angular cobbles, 30 to 65 percent pebbles)
Reaction—pH 6.6 to 7.8

Walbert Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Somewhat excessively drained
Permeability: Rapid (6.0 to 20.0 inches per hour)
Landform: Ridges, interfluves, and side slopes of hills
Parent material: Residuum derived from semiconsolidated, coarse grained sandstone
Slope range: 2 to 35 percent
Elevation range: 4,000 to 5,500 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Mixed, frigid, shallow Aridic Ustipsamments

Typical Pedon

Walbert coarse sandy loam, 4 to 15 percent slopes, in pasture, 1,100 feet east and 1,425 feet north of the southwest corner of sec. 21, T. 2 N., R. 1 W.

Ap—0 to 4 inches; light yellowish brown (2.5Y 6/4) coarse sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many medium and fine roots; many very fine pores; disseminated lime; slightly effervescent; slightly alkaline (pH 7.6); abrupt smooth boundary.
C—4 to 16 inches; grayish brown (10YR 5/2) loamy coarse sand, grayish brown (2.5Y 5/2) moist; weak coarse prismatic structure; loose, nonsticky and nonplastic; common fine and very fine roots; disseminated lime; slightly effervescent; slightly alkaline (pH 7.4); gradual wavy boundary.
Cr—16 to 60 inches; light brownish gray (10YR 6/2), semiconsolidated, coarse grained sandstone that crushes to loamy coarse sand and coarse sand.

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between a depth of 12 inches and the paralithic contact
Depth to Cr horizon: 10 to 20 inches

A horizon:
Hue—2.5Y or 10YR
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—3 or 4
Texture—coarse sandy loam or sandy clay loam
Clay content—4 to 25 percent
Content of rock fragments—0 to 5 percent pebbles (mainly less than 3/8 inch in diameter)
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 6.6 to 7.8

C horizon:
Hue—2.5Y or 10YR
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—loamy coarse sand or coarse sand
Clay content—4 to 10 percent
Content of rock fragments—0 to 5 percent pebbles
Calcium carbonate equivalent—0 to 10 percent
Reaction—pH 6.6 to 7.8

Warneke Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, divides, and side slopes of hills
Parent material: Slope alluvium or residuum derived from limestone
Slope range: 8 to 70 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, carbonatic, frigid Lithic Calciustepts

Typical Pedon

Warneke very gravelly loam, in an area of Whitecow-Warneke complex, 8 to 35 percent slopes; in a forested area, 1,800 feet north and 300 feet east of the southwest corner of sec. 3, T. 9 N., R. 3 W.

Oi—1/2 inch to 0; forest litter of partially decomposed needles, leaves, and twigs.
A—0 to 3 inches; grayish brown (10YR 5/2) very gravelly loam, dark brown (10YR 3/3) moist; moderate very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; 10 percent angular cobbles and 40 percent angular pebbles; disseminated lime,

common distinct lime coatings on undersides of fragments; strongly effervescent; slightly alkaline (pH 7.7); clear smooth boundary.
Bk1—3 to 9 inches; pale brown (10YR 6/3) extremely gravelly loam, yellowish brown (10YR 5/4) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots and few medium and coarse roots; many very fine pores; 10 percent angular cobbles and 55 percent angular pebbles; disseminated lime, continuous distinct lime casts on undersides of fragments; violently effervescent; moderately alkaline (pH 7.9); clear smooth boundary.
Bk2—9 to 12 inches; very pale brown (10YR 7/3) extremely gravelly loam, pale brown (10YR 6/3) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium and coarse roots; 10 percent angular cobbles and 65 percent angular pebbles; disseminated lime, common fine and medium threads and masses of lime, common distinct lime casts on fragments; violently effervescent; moderately alkaline (pH 8.3); clear smooth boundary.
R—12 inches; slightly fractured, light brownish gray (10YR 6/2) limestone bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)
Depth to bedrock: 10 to 20 inches
Percent of surface covered by stones: 0 to 3 percent

A horizon:
Hue—2.5Y or 10YR
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2 or 3
Clay content—10 to 25 percent
Content of rock fragments—35 to 80 percent (5 to 25 percent cobbles and stones, 30 to 55 percent pebbles)
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.4 to 8.4

Bk horizon:
Hue—2.5Y or 10YR
Value—6 or 7 dry; 5 or 6 moist
Chroma—2, 3, or 4
Clay content—10 to 25 percent
Content of rock fragments—35 to 80 percent (5 to 30 percent cobbles and stones, 30 to 65 percent pebbles)
Calcium carbonate equivalent—40 to 60 percent
Reaction—pH 7.9 to 9.0

Warwood Family

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans and side slopes of mountains
Parent material: Slope alluvium, colluvium, and residuum derived mainly from granite
Slope range: 2 to 60 percent
Elevation range: 5,500 to 8,000 feet
Annual precipitation: 15 to 30 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 30 to 70 days

Taxonomic classification: Fine-loamy, mixed, superactive Eutric Glossocryalfs

Typical Pedon

Warwood sandy loam, in an area of Elve-Warwood complex, 15 to 45 percent slopes, stony; in a forested area, 700 feet west and 700 feet south of the northeast corner of sec. 34, T. 9 N., R. 2 W.

Oi—1 inch to 0; forest litter of slightly decomposed needles, twigs, and leaves.
E—0 to 6 inches; light gray (2.5Y 7/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots and few medium roots; many very fine pores; 10 percent granite pebbles; slightly acid (pH 6.1); clear smooth boundary.
E/Bt—6 to 24 inches; 70 percent light brownish gray (2.5Y 6/2) sandy loam, dark grayish brown (2.5Y 4/2) moist (E part); 30 percent brown (10YR 5/3) sandy loam, brown (10YR 4/3) moist (Bt part); moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common fine, many very fine, and few medium and coarse roots; many very fine pores; common faint dark grayish brown (10YR 4/2) (moist) clay films bridging sand grains (Bt part); 10 percent granite pebbles; slightly acid (pH 6.1); clear wavy boundary.
Bt/E—24 to 36 inches; 80 percent brown (10YR 5/3) sandy clay loam, dark brown (10YR 3/3) moist (Bt part); 20 percent tongues of pale brown (10YR

6/3) sandy loam, brown (10YR 5/3) moist (E part); moderate fine and medium prismatic structure parting to moderate fine subangular blocky; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots and few medium and coarse roots; many very fine and common fine pores; common faint very dark grayish brown (10YR 3/2) (moist) clay films in pores and bridging sand grains of the Bt part; 10 percent granite pebbles; slightly acid (pH 6.5); clear wavy boundary.

Bt—36 to 60 inches; light brownish gray (2.5Y 6/2) very gravelly sandy clay loam, olive brown (2.5Y 4/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; common very fine pores; common distinct dark grayish brown (10YR 4/2) (moist) clay films on faces of peds and bridging sand grains; 15 percent granite cobbles and 35 percent granite pebbles; slightly acid (pH 6.4).

Range in Characteristics

Soil temperature: 36 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to argillic horizon: 4 to 24 inches
Percent of surface covered by stones/boulders: 0 to 3 percent
Other features: Some pedons have a thin A horizon.

E horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Texture—sandy loam, loam, or sandy clay loam
Clay content—10 to 27 percent
Content of rock fragments—5 to 25 percent (0 to 10 percent cobbles, 5 to 15 percent pebbles)
Reaction—pH 5.6 to 6.5

E/Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5 or 6 dry (E part); 4 or 5 dry, 3 or 4 moist (Bt part)
Chroma—2 or 3
Texture—sandy loam or sandy clay loam
Clay content—10 to 30 percent
Content of rock fragments—5 to 35 percent (0 to 15 percent cobbles, 5 to 20 percent pebbles)
Reaction—pH 5.6 to 6.5

Bt/E horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 or 5 dry, 3 or 4 moist (Bt part); 5 or 6 dry, 4 or 5 moist (E part)
Chroma—2, 3, or 4
Texture (mixed)—sandy clay loam or clay loam
Clay content—25 to 35 percent
Content of rock fragments—5 to 35 percent (0 to 15 percent cobbles, 5 to 20 percent pebbles)
Reaction—pH 5.6 to 6.5

Bt horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5 or 6 dry; 3 or 4 moist
Chroma—2, 3, or 4
Texture—sandy loam or sandy clay loam
Clay content—15 to 27 percent
Content of rock fragments—25 to 50 percent (0 to 15 percent cobbles, 5 to 35 percent pebbles)
Reaction—pH 6.1 to 7.3

Watne Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Alluvial fans, knolls, interfluves, and side slopes of hills
Parent material: Slope alluvium derived from limestone or argillite
Slope range: 2 to 15 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 95 days

Taxonomic classification: Fine-loamy, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Watne loam, 2 to 8 percent slopes, in rangeland, 1,450 feet north and 350 feet west of the southeast corner of sec. 2, T. 1 N., R. 2 W.

A1—0 to 3 inches; very dark grayish brown (10YR 3/2) loam, black (10YR 2/1) moist; moderate very fine and fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; 5 percent rounded pebbles; neutral (pH 6.8); clear wavy boundary.

A2—3 to 10 inches; very dark grayish brown (10YR 3/2) silt loam, black (10YR 2/1) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots; many very fine and fine pores; 5 percent rounded pebbles; neutral (pH 7.0); clear wavy boundary.

Bt1—10 to 14 inches; grayish brown (10YR 5/2) silty

clay loam, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; 5 percent rounded pebbles; neutral (pH 7.0); clear wavy boundary.

Bt2—14 to 20 inches; brown (10YR 5/3) silt loam, brown (10YR 4/3) moist; moderate medium and coarse prismatic structure; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; many very fine and fine pores; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; 5 percent rounded pebbles; moderately alkaline (pH 8.0); gradual wavy boundary.

Bk1—20 to 31 inches; light gray (10YR 7/2) gravelly loam, light brownish gray (10YR 6/2) moist; moderate coarse prismatic structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine and fine roots; common very fine and fine pores; 25 percent rounded pebbles; disseminated lime, common fine masses and threads of lime, common distinct lime coatings around pebbles; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

Bk2—31 to 60 inches; very pale brown (10YR 7/3) gravelly loam, pale brown (10YR 6/3) moist; weak coarse prismatic structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine roots; few very fine and fine pores; 20 percent rounded pebbles; disseminated lime, common fine masses and threads of lime, common distinct lime coatings around pebbles; violently effervescent; moderately alkaline (pH 8.4).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 10 to 15 inches
Depth to Bt horizon: 10 to 15 inches
Depth to Bk horizon: 16 to 28 inches

A horizon:
- Hue—7.5YR, 10YR, or 2.5Y
- Value—3 or 4 dry; 2 or 3 moist
- Chroma—1 or 2
- Texture—loam or silt loam
- Clay content—15 to 27 percent
- Content of rock fragments—0 to 15 percent pebbles
- Reaction—pH 6.6 to 7.8

Bt horizon:
- Hue—7.5YR, 10YR, or 2.5Y
- Value—4, 5, or 6 dry; 3, 4, or 5 moist
- Chroma—2 or 3
- Texture—silt loam or silty clay loam
- Clay content—25 to 35 percent
- Content of rock fragments—0 to 15 percent pebbles
- Reaction—pH 6.6 to 8.4

Bk1 horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—loam, silt loam, or silty clay loam
- Clay content—18 to 30 percent
- Content of rock fragments—10 to 30 percent pebbles
- Calcium carbonate equivalent—15 to 25 percent
- Reaction—pH 7.4 to 8.4

Bk2 horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—loam, silt loam, or fine sandy loam
- Clay content—15 to 27 percent
- Content of rock fragments—10 to 30 percent pebbles
- Calcium carbonate equivalent—10 to 20 percent
- Reaction—pH 7.4 to 8.4

Wetsand Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Poorly drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour) in the upper 14 inches and rapid (6.0 to 20.0 inches per hour) below a depth of 14 inches
Landform: Flood plains, flood-plain steps, and drainageways
Parent material: Recent alluvium derived from mixed rock sources
Slope range: 0 to 2 percent
Elevation range: 3,800 to 5,500 feet
Annual precipitation: 10 to 16 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 80 to 115 days

Taxonomic classification: Fine-loamy over sandy or sandy-skeletal, mixed, superactive, calcareous, frigid Aeric Fluvaquents

Typical Pedon

Wetsand loam, in an area of Clunton-Wetsand-

Bonebasin complex, 0 to 2 percent slopes, in rangeland, 1,000 feet south and 2,225 feet east of the northwest corner of sec. 9, T. 1 N., R. 3 W.

A1—0 to 2 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

A2—2 to 5 inches; light brownish gray (10YR 6/2) loam with thin strata of silty clay loam, silt loam, and sandy loam, dark grayish brown (10YR 4/2) moist; strong fine granular structure; slightly hard, friable, moderately sticky and moderately plastic; many fine and very fine roots; disseminated lime; strongly effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

AC—5 to 10 inches; pale brown (10YR 6/3) silt loam, dark grayish brown (10YR 4/2) moist; moderate medium and thick platy structure; soft, very friable, slightly sticky and slightly plastic; many fine and very fine roots; 15 percent rounded pebbles; common fine prominent reddish brown (2.5YR 4/4) redox concentrations; disseminated lime, common faint lime coatings on undersides of fragments; strongly effervescent; strongly alkaline (pH 8.6); clear smooth boundary.

C1—10 to 14 inches; brown (10YR 5/3) silt loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; 15 percent rounded pebbles; common fine prominent reddish brown (2.5YR 4/4) redox concentrations; disseminated lime, common distinct lime coatings on fragments; slightly effervescent; moderately alkaline (pH 8.2); clear smooth boundary.

2C2—14 to 60 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, brown (10YR 5/3) moist; single grain; loose, nonsticky and nonplastic; few very fine roots; 15 percent rounded cobbles and 55 percent rounded pebbles; disseminated lime, many distinct lime coatings on fragments in the upper 20 inches; slightly effervescent; moderately alkaline (pH 8.0).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to 2C horizon: 12 to 16 inches
Depth to seasonal high water table: 12 to 24 inches
Note: A saline phase is recognized.

A horizon:
- Value—4, 5, or 6 dry; 3 or 4 moist
- Chroma—1, 2, or 3
- Texture—clay loam, loam, or sandy loam with thin strata of silty clay loam, silt loam, very fine sandy loam, and fine sandy loam
- Clay content—6 to 35 percent
- Content of rock fragments—0 to 20 percent pebbles
- Electrical conductivity—0 to 4 mmhos/cm; 4 to 16 mmhos/cm in the saline phase
- Sodium adsorption ratio—0 to 2; 4 to 13 in the saline phase
- Calcium carbonate equivalent—0 to 5 percent; 3 to 10 percent in the saline phase
- Reaction—pH 7.4 to 8.4; pH 8.5 to 9.0 in the saline phase

AC horizon:
- Value—5 or 6 dry
- Chroma—2 or 3
- Texture—loam, silt loam, or sandy loam
- Clay content—10 to 25 percent
- Content of rock fragments—0 to 25 percent pebbles
- Electrical conductivity—0 to 4 mmhos/cm; 4 to 16 mmhos/cm in the saline phase
- Sodium adsorption ratio—0 to 2; 4 to 13 in the saline phase
- Calcium carbonate equivalent—0 to 5 percent; 3 to 15 percent in the saline phase
- Reaction—pH 7.4 to 8.4; pH 7.4 to 9.0 in the saline phase

C1 horizon:
- Value—5, 6, or 7 dry; 4 or 5 moist
- Chroma—2 or 3
- Texture—sandy loam, loam, or silt loam
- Clay content—5 to 20 percent
- Content of rock fragments—0 to 35 percent (0 to 10 percent cobbles, 0 to 25 percent pebbles)
- Electrical conductivity—0 to 4 mmhos/cm; 4 to 16 mmhos/cm in the saline phase
- Sodium adsorption ratio—0 to 2; 4 to 13 in the saline phase
- Calcium carbonate equivalent—0 to 5 percent; 3 to 15 percent in the saline phase
- Reaction—pH 7.4 to 8.4; pH 7.4 to 9.0 in the saline phase

2C2 horizon:
- Value—5, 6, 7, or 8 dry; 4, 5, 6, or 7 moist
- Chroma—2 or 3
- Texture—loamy sand, sand, or coarse sand

Clay content—0 to 10 percent
Content of rock fragments—35 to 80 percent (5 to 20 percent cobbles, 30 to 60 percent pebbles)
Electrical conductivity—0 to 2 mmhos/cm; 2 to 8 mmhos/cm in the saline phase
Sodium adsorption ratio—0 to 2; 0 to 4 in the saline phase
Calcium carbonate equivalent—0 to 10 percent; 0 to 10 percent in the saline phase
Reaction—pH 7.4 to 8.4; pH 7.4 to 8.4 in the saline phase

Whitecow Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, divides, ridges, and side slopes of hills
Parent material: Slope alluvium and colluvium derived from limestone
Slope range: 8 to 70 percent
Elevation range: 4,000 to 6,200 feet
Annual precipitation: 12 to 19 inches
Annual air temperature: 38 to 42 degrees F
Frost-free period: 80 to 110 days

Taxonomic classification: Loamy-skeletal, carbonatic, frigid Typic Calciustepts

Typical Pedon

Whitecow channery loam, in an area of Whitecow-Warneke complex, 8 to 35 percent slopes; in a forested area, 400 feet east and 2,000 feet north of the southwest corner of sec. 3, T. 9 N., R. 3 W.

Oi—1 inch to 0; undecomposed forest litter of needles and twigs.
A—0 to 4 inches; grayish brown (10YR 5/2) channery loam, very dark grayish brown (10YR 3/2) moist; weak medium and fine granular structure; soft, very friable, slightly sticky and slightly plastic; common fine and few medium roots; 25 percent channers; disseminated lime, common faint lime coatings on undersides of fragments; strongly effervescent; slightly alkaline (pH 7.7); clear smooth boundary.
Bk1—4 to 12 inches; light brownish gray (10YR 6/2) very channery loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots and few coarse roots; common fine pores; 40 percent channers and 5 percent angular cobbles; disseminated lime, continuous faint lime crusts on undersides of rock fragments; violently effervescent; moderately alkaline (pH 8.0); clear wavy boundary.
Bk2—12 to 49 inches; light gray (2.5Y 7/2) extremely channery loam, light yellowish brown (2.5Y 6/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots and few medium and coarse roots; common fine pores; 60 percent channers and 15 percent angular cobbles; disseminated lime, common fine and medium threads and masses of lime, continuous prominent lime casts on rock fragments; violently effervescent; moderately alkaline (pH 8.3); gradual wavy boundary.
Bk3—49 to 60 inches; light yellowish brown (2.5Y 6/4) extremely channery loam, light olive brown (2.5Y 5/6) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; few fine roots; few fine pores; 70 percent channers and 10 percent angular cobbles; disseminated lime, continuous distinct lime casts on rock fragments; violently effervescent; moderately alkaline (pH 8.0).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
Hue—2.5Y or 10YR
Value—4, 5, or 6 dry; 3 or 4 moist
Chroma—2 or 3
Clay content—18 to 27 percent
Content of rock fragments—15 to 60 percent (0 to 30 percent stones and cobbles, 5 to 35 percent channers)
Calcium carbonate equivalent—0 to 10 percent
Reaction—pH 7.4 to 8.4

Bk1 and Bk2 horizons:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, or 4
Texture—loam or clay loam
Clay content—18 to 35 percent
Content of rock fragments—35 to 70 percent (0 to 30 percent stones and cobbles, 5 to 60 percent channers)
Calcium carbonate equivalent—35 to 50 percent
Reaction—pH 7.4 to 9.0

Bk3 horizon:
Hue—10YR or 2.5Y
Value—6, 7, or 8 dry; 4, 5, 6, or 7 moist
Chroma—2, 3, 4, or 6
Texture—clay loam, loam, or sandy loam
Clay content—18 to 35 percent
Content of rock fragments—60 to 90 percent) 5 to 30 percent stones and cobbles, 55 to 70 percent channers)
Calcium carbonate equivalent—25 to 40 percent
Reaction—pH 7.4 to 9.0

Whitlash Series

Depth class: Shallow (10 to 20 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, escarpments, ridges, and side slopes of hills
Parent material: Residuum derived from hard sandstone or fine grained igneous rock
Slope range: 2 to 70 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Lithic Haplustolls

Typical Pedon

Whitlash very cobbly loam, in an area of Whitlash-Whitlash, stony-Rock outcrop complex, 15 to 35 percent slopes, in rangeland, 250 feet east and 900 feet north of the southwest corner of sec. 26, T. 4 N., R. 2 W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) very cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate medium and fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 25 percent angular cobbles and 20 percent angular pebbles; neutral (pH 6.8); clear smooth boundary.
Bw—3 to 11 inches; grayish brown (10YR 5/2) extremely gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; many very fine and fine roots; slightly hard, very friable, slightly sticky and slightly plastic; 20 percent angular cobbles and 45 percent angular pebbles; neutral (pH 7.2); abrupt smooth boundary.
R—11 inches; hard, slightly fractured sandstone bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches or between a depth of 4 inches and the lithic contact (if it occurs at a depth of less than 12 inches)
Thickness of the mollic epipedon: 7 to 10 inches
Depth to bedrock: 10 to 20 inches
Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—3 or 4 dry; 2 or 3 moist
Chroma—1, 2, or 3
Texture—loam or coarse sandy loam
Clay content—5 to 27 percent
Content of rock fragments—15 to 60 percent (0 to 30 percent cobbles or stones, 15 to 35 percent pebbles)
Reaction—pH 6.1 to 7.3

Bw horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Texture—loam, sandy clay loam, or sandy loam
Clay content—5 to 27 percent
Content of rock fragments—35 to 80 percent (5 to 50 percent cobbles or stones, 15 to 60 percent pebbles)
Reaction—pH 6.1 to 7.3

Whitore Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans and side slopes of mountains
Parent material: Slope alluvium and colluvium derived from limestone
Slope range: 8 to 70 percent
Elevation range: 5,500 to 7,500 feet
Annual precipitation: 15 to 24 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 50 to 70 days

Taxonomic classification: Loamy-skeletal, carbonatic Typic Eutrocryepts

Typical Pedon

Whitore very gravelly loam, in an area of Tropal, bouldery-Rock outcrop-Whitore, bouldery, complex, 15 to 45 percent slopes; in a forested area, 950 feet south

and 2,100 feet east of the northwest corner of sec. 2, T. 5 N., R. 2 W.

Oi—1 inch to 0; forest litter of decomposed needles, twigs, and leaves.
A—0 to 5 inches; brown (10YR 4/3) very gravelly loam, dark brown (10YR 3/3) moist; moderate medium granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots and few medium roots; 5 percent angular cobbles and 35 percent angular pebbles; disseminated lime; slightly effervescent; slightly alkaline (pH 7.5); clear wavy boundary.
Bw—5 to 12 inches; brown (10YR 5/3) very gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and few medium roots; many very fine pores; 5 percent angular cobbles and 40 percent angular pebbles; disseminated lime, common faint lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 7.9); clear wavy boundary.
Bk1—12 to 29 inches; light gray (10YR 7/2) very gravelly loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine, fine, medium, and coarse roots; many very fine and fine pores; 5 percent angular cobbles and 50 percent angular pebbles; disseminated lime, common distinct lime casts on surface and pendants on undersides of fragments; violently effervescent; moderately alkaline (pH 8.3); gradual irregular boundary.
Bk2—29 to 60 inches; light brownish gray (10YR 6/2) extremely gravelly loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and nonplastic; few very fine, fine, medium, and coarse roots; common fine and very fine pores; 10 percent angular cobbles and 65 percent angular pebbles; disseminated lime, many distinct lime casts on surface and pendants on undersides of fragments; violently effervescent; moderately alkaline (pH 8.3).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bk horizon: 5 to 15 inches
Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3 or 4 moist
Chroma—1, 2, or 3
Clay content—18 to 27 percent
Content of rock fragments—15 to 45 percent (5 to 20 percent cobbles and stones, 10 to 35 percent pebbles)
Calcium carbonate equivalent—5 to 10 percent
Reaction—pH 7.4 to 8.4

Bw horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Clay content—18 to 27 percent
Content of rock fragments—15 to 60 percent (5 to 25 percent cobbles and stones, 5 to 40 percent pebbles)
Calcium carbonate equivalent—35 to 50 percent
Reaction—pH 7.4 to 9.0

Bk horizon:
Hue—10YR or 2.5Y
Value—6, 7, or 8 dry; 4, 5, 6, or 7 moist
Chroma—2, 3, or 4
Clay content—18 to 27 percent
Content of rock fragments—35 to 85 percent (0 to 40 percent cobbles and stones, 25 to 65 percent pebbles)
Calcium carbonate equivalent—40 to 50 percent
Reaction—pH 7.4 to 9.0

Wickes Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, interfluves, and side slopes of hills
Parent material: Local colluvium, slope alluvium, and residuum derived from hard, fine grained sandstone or fine grained igneous rock
Slope range: 2 to 70 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Argiustolls

Typical Pedon

Wickes very gravelly loam, in an area of Shawmut, bouldery-Wickes, stony-Tolbert, bouldery, complex, 15 to 35 percent slopes, in rangeland, 2,200 feet south

and 1,500 feet west of the northeast corner of sec. 16, T. 9 N., R. 3 W.

A—0 to 8 inches; dark grayish brown (10YR 4/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, moderately sticky and slightly plastic; many very fine and few fine roots; many fine and very fine pores; 10 percent angular cobbles and 30 percent angular pebbles; neutral (pH 6.8); clear smooth boundary.

Bt1—8 to 15 inches; brown (10YR 5/3) very gravelly clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, moderately sticky and moderately plastic; many very fine and few fine roots; many very fine and fine pores; common distinct brown (10YR 4/3) clay films on faces of peds and bridging sand grains; 15 percent angular cobbles and 30 percent angular pebbles; neutral (pH 6.8); clear wavy boundary.

Bt2—15 to 24 inches; light olive brown (2.5Y 5/4) very cobbly loam, olive brown (2.5Y 4/4) moist; weak very fine and fine subangular blocky structure; soft, very friable, moderately sticky and slightly plastic; many very fine and fine roots; many very fine and fine pores; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds and bridging sand grains; 30 percent angular cobbles and 25 percent angular pebbles; slightly alkaline (pH 7.6); clear wavy boundary.

Bk—24 to 30 inches; light yellowish brown (2.5Y 6/4) extremely cobbly loam, olive brown (2.5Y 4/4) moist; weak very fine and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine roots; common very fine and fine pores; 40 percent angular cobbles and 25 percent angular pebbles; disseminated lime, common fine masses of lime, common distinct lime coatings on fragments; strongly effervescent; slightly alkaline (pH 7.6); clear smooth boundary.

R—30 inches; dark gray (10YR 4/1), hard, fine grained igneous bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 8 to 10 inches
Depth to Bt horizon: 6 to 13 inches
Depth to Bk horizon: 12 to 24 inches
Depth to bedrock: 20 to 40 inches
Percent of surface covered by stones/boulders: 0.01 to 3.0 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—4 or 5 dry; 2 or 3 moist
- Chroma—1, 2, or 3
- Clay content—15 to 27 percent
- Content of rock fragments—15 to 45 percent (0 to 5 percent stones, 0 to 15 percent cobbles, 15 to 30 percent pebbles)
- Reaction—pH 6.1 to 7.3

Bt horizon:
- Hue—10YR or 2.5Y
- Value—4 or 5
- Chroma—2, 3, or 4
- Texture—clay loam or loam
- Clay content—23 to 30 percent
- Content of rock fragments—35 to 60 percent (0 to 5 percent stones, 10 to 30 percent cobbles, 20 to 30 percent pebbles)
- Reaction—pH 6.1 to 7.8

Bk horizon:
- Hue—10YR or 2.5Y
- Value—5, 6, 7, or 8 dry; 4, 5, 6, or 7 moist
- Chroma—2, 3, or 4
- Texture—loam or sandy loam
- Clay content—15 to 25 percent
- Content of rock fragments—35 to 70 percent (0 to 10 percent stones, 20 to 40 percent cobbles, 15 to 30 percent pebbles)
- Calcium carbonate equivalent—10 to 25 percent
- Reaction—pH 7.4 to 8.4

Wilde Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderately rapid (2.0 to 6.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of hills
Parent material: Residuum, slope alluvium, and colluvium derived from hard, brown shale or argillite
Slope range: 4 to 70 percent
Elevation range: 4,400 to 6,500 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 95 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Haplustepts

Typical Pedon

Wilde very channery loam, in an area of Deville-Wilde-

Rock outcrop complex, 25 to 60 percent slopes; in a forested area, 150 feet south and 2,740 feet west of the northeast corner of sec. 19, T. 2 N., R. 3 W.

A—0 to 5 inches; grayish brown (10YR 5/2) very channery loam, dark grayish brown (10YR 4/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and nonplastic; many fine and very fine roots; 10 percent flagstones and 30 percent channers; neutral (pH 6.6); clear wavy boundary.

Bw1—5 to 21 inches; light brownish gray (10YR 6/2) extremely channery loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many fine and very fine roots; many fine and very fine pores; 10 percent flagstones and 60 percent channers; neutral (pH 6.8); gradual irregular boundary.

Bw2—21 to 34 inches; pale brown (10YR 6/3) extremely channery loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many fine and very fine roots; many fine and very fine pores; 10 percent flagstones and 65 percent channers; neutral (pH 7.0); clear wavy boundary.

R—34 inches; brown (10YR 5/3), hard, fractured shale.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to bedrock: 20 to 40 inches
Percent of surface covered by stones: 0 to 0.1 percent

A horizon:
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2, 3, or 4
- Clay content—15 to 27 percent
- Content of rock fragments—25 to 50 percent (0 to 10 percent flagstones, 15 to 40 percent channers)
- Reaction—pH 6.6 to 7.3

Bw1 horizon:
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2 or 3
- Texture—loam or sandy loam
- Clay content—15 to 27 percent
- Content of rock fragments—35 to 75 percent (5 to 15 percent flagstones, 30 to 60 percent channers)
- Reaction—pH 6.6 to 7.3

Bw2 horizon:
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—3 or 4
- Texture—loam or sandy loam
- Clay content—18 to 27 percent
- Content of rock fragments—35 to 80 percent (5 to 15 percent flagstones, 30 to 65 percent channers)
- Reaction—pH 6.6 to 7.3

Wilspring Series

Depth class: Moderately deep (20 to 40 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, and side slopes of hills
Parent material: Local colluvium, slope alluvium, and residuum derived from hard, brown shale or argillite
Slope range: 2 to 35 percent
Elevation range: 4,400 to 6,500 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 38 to 45 degrees F
Frost-free period: 80 to 95 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Haplustepts

Typical Pedon

Wilspring channery loam, in an area of Wilspring-Devilfence complex, 4 to 15 percent slopes, in rangeland, 2,300 feet north and 2,000 feet east of the southwest corner of sec. 35, T. 4 N., R. 2 W.

A—0 to 3 inches; dark grayish brown (10YR 4/2) channery loam, dark brown (10YR 3/3) moist; moderate medium granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine and very fine roots; 5 percent flagstones and 20 percent channers; slightly effervescent; slightly alkaline (pH 7.8); clear wavy boundary.

Bw—3 to 7 inches; brown (10YR 5/3) channery loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots; common or many fine and very fine pores; 5 percent flagstones and 20 percent channers; slightly effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

Bk1—7 to 12 inches; pale brown (10YR 6/3) very channery loam, yellowish brown (10YR 5/4) moist;

moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many fine and very fine roots; common or many fine and very fine pores; 5 percent flagstones and 35 percent channers; disseminated lime, common distinct lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.3); gradual wavy boundary.

Bk2—12 to 24 inches; light gray (10YR 7/2) very channery loam, light yellowish brown (10YR 6/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common or many very fine roots; few or common fine and very fine pores; 5 percent flagstones and 45 percent channers; disseminated lime, few fine masses of lime, continuous distinct lime crusts on surfaces of rock fragments; violently effervescent; moderately alkaline (pH 8.4); clear smooth boundary.

R—24 inches; brown (10YR 5/3), hard, fractured shale.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bk horizon: 7 to 10 inches
Depth to bedrock: 20 to 40 inches

A horizon:
Value—4 or 5 dry
Chroma—2, 3, or 4
Clay content—15 to 27 percent
Content of rock fragments—15 to 30 percent (0 to 5 percent flagstones, 15 to 25 percent channers)
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 7.4 to 8.4

Bw horizon:
Value—5 or 6 dry
Chroma—2 or 3
Clay content—15 to 27 percent
Content of rock fragments—15 to 35 percent (0 to 5 percent flagstones, 15 to 30 percent channers)
Calcium carbonate equivalent—3 to 7 percent
Reaction—pH 7.4 to 8.4

Bk horizon:
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2, 3, 4, 5, or 6
Clay content—18 to 27 percent
Content of rock fragments—35 to 80 percent (5 to 10 percent flagstones, 30 to 70 percent channers)
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 8.4

Wimper Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Stream terraces, alluvial fans, and side slopes of hills
Parent material: Alluvium or colluvium derived mainly from hard, fine grained sandstone or fine grained igneous rock
Slope range: 2 to 60 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Haplustolls

Typical Pedon

Wimper gravelly loam, in an area of Wimper-Wimper, stony, complex, 15 to 35 percent slopes, in rangeland, 450 feet north and 300 feet east of the southwest corner of sec. 6, T. 1 N., R. 2 W.

A—0 to 7 inches; very dark grayish brown (10YR 3/2) gravelly loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and fine roots and few medium roots; 20 percent pebbles; neutral (pH 7.3); clear wavy boundary.

Bw—7 to 13 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine roots and few fine and medium roots; many very fine and fine pores; 20 percent pebbles; slightly alkaline (pH 7.6); clear wavy boundary.

Bk1—13 to 17 inches; brown (10YR 5/3) very gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common fine roots and few fine and medium roots; many very fine and fine pores; 35 percent pebbles; disseminated lime, many faint lime coatings on undersides of fragments; strongly effervescent;

moderately alkaline (pH 8.2); clear wavy boundary.

Bk2—17 to 31 inches; white (10YR 8/2) very gravelly loam, grayish brown (10YR 5/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots and few fine and medium roots; many very fine and fine pores; 40 percent pebbles; disseminated lime, few very fine and fine masses and threads of lime, continuous distinct lime casts on undersides of fragments; violently effervescent; moderately alkaline (pH 8.3); gradual wavy boundary.

Bk3—31 to 60 inches; light gray (10YR 7/2) very gravelly loam, light brownish gray (10YR 6/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; common very fine and fine pores; 55 percent pebbles; disseminated lime, few very fine and fine masses and threads of lime, continuous faint lime coatings on undersides of fragments; violently effervescent; moderately alkaline (pH 8.3).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 15 inches
Depth to Bk horizon: 10 to 15 inches
Percent of surface covered by stones: 0 to 0.1 percent

A horizon:
Hue—7.5YR or 10YR
Value—3, 4, or 5 dry; 2 or 3 moist
Chroma—1, 2, or 3
Clay content—15 to 27 percent
Content of rock fragments—5 to 35 percent (0 to 10 percent cobbles, 15 to 35 percent pebbles)
Reaction—pH 6.6 to 7.8

Bw horizon:
Hue—7.5YR or 10YR
Value—4, 5, or 6 dry; 3, 4, or 5 moist
Chroma—2, 3, or 4
Texture—loam or silt loam
Clay content—15 to 27 percent
Content of rock fragments—15 to 50 percent (0 to 10 percent cobbles, 15 to 40 percent pebbles)
Calcium carbonate equivalent—0 to 3 percent
Reaction—pH 6.6 to 7.8

Bk1 horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2 or 3
Texture—loam or silt loam
Clay content—15 to 27 percent
Content of rock fragments—35 to 60 percent (0 to 10 percent cobbles, 35 to 50 percent pebbles)
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 8.4

Bk2 horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—6, 7, or 8 dry; 5 or 6 moist
Chroma—2 or 3
Texture—loam or silt loam
Clay content—15 to 27 percent
Content of rock fragments—35 to 60 percent (0 to 15 percent cobbles, 35 to 45 percent pebbles)
Calcium carbonate equivalent—15 to 25 percent
Reaction—pH 7.9 to 9.0

Bk3 horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—2 or 3
Texture—loam or silt loam
Clay content—15 to 27 percent
Content of rock fragments—35 to 70 percent (0 to 15 percent cobbles, 35 to 55 percent pebbles)
Calcium carbonate equivalent—5 to 15 percent
Reaction—pH 7.9 to 9.0

Windham Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, divides, and side slopes of hills
Parent material: Slope alluvium and colluvium derived from limestone
Slope range: 2 to 70 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 105 days

Taxonomic classification: Loamy-skeletal, carbonatic, frigid Typic Calciustolls

Typical Pedon

Windham gravelly loam, in an area of Windham-Rock outcrop-Lap, very stony, complex, 8 to 35 percent slopes; in a forested area, 900 feet west and 150 feet south of the northeast corner of sec. 5, T. 1 N., R. 1 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark brown (10YR 2/2) moist;

moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; 5 percent limestone cobbles and 15 percent limestone pebbles; slightly effervescent; slightly alkaline (pH 7.4); clear wavy boundary.

Bk1—7 to 11 inches; pale brown (10YR 6/3) very gravelly loam, dark grayish brown (10YR 4/2) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots; many fine and very fine pores; 10 percent limestone cobbles and 35 percent limestone pebbles; disseminated lime, continuous prominent casts and pendants on undersides of fragments; violently effervescent; moderately alkaline (pH 8.0); clear wavy boundary.

Bk2—11 to 25 inches; light gray (10YR 7/2) very gravelly loam, grayish brown (10YR 5/2) moist; massive; slightly hard, friable, slightly sticky and nonplastic; many fine and very fine roots; many fine and very fine pores; 10 percent limestone cobbles and 40 percent limestone pebbles; disseminated lime, common fine masses of lime, continuous prominent lime casts and pendants on undersides of fragments; violently effervescent; moderately alkaline (pH 8.2); diffuse wavy boundary.

Bk3—25 to 60 inches; pale brown (10YR 6/3) extremely gravelly loam, brown (10YR 5/3) moist; massive; slightly hard, friable, slightly sticky and nonplastic; common fine and very fine roots; few or common fine and very fine pores; 15 percent limestone cobbles and 50 percent limestone pebbles; disseminated lime, common fine masses of lime, continuous distinct lime casts and pendants on undersides of pebbles and cobbles; violently effervescent; moderately alkaline (pH 8.2).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 12 inches
Depth to Bk horizon: 5 to 10 inches
Percent of surface covered by stones/boulders: 0 to 3 percent

Ap horizon:
Hue—2.5Y or 10YR
Value—4 or 5 dry; 2 or 3 moist
Chroma—1, 2, or 3
Clay content—18 to 27 percent
Content of rock fragments—15 to 60 percent (0 to 15 percent stones, 5 to 20 percent cobbles, 10 to 50 percent pebbles)
Calcium carbonate equivalent—5 to 10 percent
Reaction—pH 7.4 to 8.4

Bk1 horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3, 4, 5, or 6 moist
Chroma—2, 3, or 4
Clay content—15 to 27 percent
Content of rock fragments—10 to 75 percent (0 to 20 percent cobbles, 10 to 55 percent pebbles)
Calcium carbonate equivalent—40 to 60 percent
Reaction—pH 7.9 to 8.4

Bk2 horizon:
Hue—10YR or 2.5Y
Value—5, 6, 7, or 8 dry; 4, 5, 6, or 7 moist
Chroma—2, 3, or 4
Clay content—15 to 27 percent
Content of rock fragments—35 to 75 percent (0 to 20 percent cobbles, 35 to 55 percent pebbles)
Calcium carbonate equivalent—40 to 60 percent
Reaction—pH 7.9 to 8.4

Bk3 horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—5, 6, 7, or 8 dry; 4, 5, 6, or 7 moist
Chroma—2, 3, or 4
Texture—loam or sandy loam
Clay content—15 to 27 percent
Content of rock fragments—60 to 80 percent (5 to 20 percent cobbles, 55 to 60 percent pebbles)
Calcium carbonate equivalent—25 to 50 percent
Reaction—pH 7.9 to 9.0

Work Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Alluvial fans, stream terraces, and side slopes of hills
Parent material: Alluvium and glacial outwash derived from mixed rock sources
Slope range: 2 to 25 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 80 to 95 days

Taxonomic classification: Fine, smectitic, frigid Typic Argiustolls

Typical Pedon

Work clay loam, in an area of Martinsdale-Work complex, 2 to 8 percent slopes, in rangeland, 1,500 feet west and 2,500 feet south of the northeast corner of sec. 33, T. 5 N., R. 2 W.

A—0 to 3 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; 10 percent rounded pebbles; neutral (pH 6.6); clear smooth boundary.

Bt—3 to 11 inches; dark grayish brown (10YR 4/2) clay, dark brown (10YR 3/3) moist; moderate medium prismatic structure parting to strong medium and fine blocky; hard, firm, moderately sticky and moderately plastic; many fine and very fine roots; common fine and very fine pores; continuous faint clay films on faces of peds; 5 percent rounded pebbles; slightly alkaline (pH 7.6); clear wavy boundary.

Btk—11 to 17 inches; grayish brown (2.5Y 5/2) clay, brown (10YR 4/3) moist; moderate medium prismatic structure parting to weak medium blocky; hard, friable, moderately sticky and moderately plastic; common fine and very fine roots; common fine and very fine pores; common faint clay films on vertical faces of peds; 5 percent rounded pebbles; disseminated lime, common fine and very fine masses of lime; strongly effervescent; moderately alkaline (pH 8.0); gradual wavy boundary.

Bk1—17 to 32 inches; pale brown (10YR 6/3) clay loam, brown (10YR 5/3) moist; moderate medium and coarse prismatic structure; hard, friable, moderately sticky and moderately plastic; few or common fine roots; many fine and very fine pores; 10 percent rounded pebbles; disseminated lime, many fine and very fine threads and masses of lime, continuous faint lime coatings on undersides of fragments; violently effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

Bk2—32 to 43 inches; grayish brown (10YR 5/2) clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, friable, moderately sticky and slightly plastic; few very fine roots; many fine pores; 10 percent rounded pebbles; disseminated lime, few fine masses of lime, common faint lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.2); gradual wavy boundary.

Bk3—43 to 60 inches; brown (10YR 5/3) gravelly clay loam, dark brown (10YR 4/3) moist; massive; hard, friable, moderately sticky and moderately plastic; 20 percent rounded pebbles; disseminated lime, common distinct lime coatings on undersides of fragments; strongly effervescent; moderately alkaline (pH 8.0).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Thickness of the mollic epipedon: 7 to 11 inches
Depth to Bt horizon: 3 to 9 inches
Depth to Bk horizon: 11 to 18 inches
Percent of surface covered by stones: 0 to 0.1 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—4 or 5 dry; 2 or 3 moist
- Chroma—2 or 3
- Texture—loam, clay loam, or sandy clay loam
- Clay content—20 to 35 percent
- Content of rock fragments—0 to 60 percent (0 to 30 percent stones or cobbles, 0 to 30 percent pebbles)
- Reaction—pH 6.1 to 7.8

Bt horizon:
- Hue—7.5YR, 10YR, or 2.5Y
- Value—4 or 5 dry; 2, 3, or 4 moist
- Chroma—2 or 3
- Texture—clay loam, clay, or silty clay
- Clay content—35 to 50 percent
- Content of rock fragments—0 to 15 percent (0 to 5 percent cobbles or stones, 0 to 10 percent pebbles)
- Reaction—pH 6.6 to 7.8

Btk horizon:
- Hue—7.5YR, 10YR, or 2.5Y
- Value—5, 6, or 7 dry; 4 or 5 moist
- Chroma—2, 3, or 4
- Texture—clay or clay loam
- Clay content—30 to 40 percent
- Content of rock fragments—0 to 15 percent (0 to 5 percent cobbles or stones, 0 to 10 percent pebbles)
- Calcium carbonate equivalent—5 to 15 percent
- Reaction—pH 7.4 to 8.4

Bk horizon:
- Hue—7.5YR, 10YR, or 2.5Y
- Value—5, 6, or 7 dry; 4, 5, or 6 moist
- Chroma—2, 3, or 4
- Texture—loam or clay loam
- Clay content—20 to 35 percent
- Content of rock fragments—0 to 35 percent (0 to 5 percent cobbles, 0 to 30 percent pebbles)

Calcium carbonate equivalent—3 to 10 percent
Reaction—pH 7.4 to 8.4

Worock Family

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Alluvial fans, valleys, and side slopes of mountains
Parent material: Slope alluvium, colluvium, and glacial outwash derived mainly from fine grained igneous and metamorphic rocks
Slope range: 2 to 60 percent
Elevation range: 5,500 to 8,000 feet
Annual precipitation: 15 to 30 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 30 to 70 days

Taxonomic classification: Loamy-skeletal, mixed, superactive Eutric Haplocryalfs

Typical Pedon

Worock very cobbly loam, in an area of Worock, very bouldery-Elve, very stony, complex, 15 to 35 percent slopes; in a forested area, 1,400 feet north and 575 feet west of the southeast corner of sec. 13, T. 3 N., R. 4 W.

Oi—3 inches to 0; forest litter of partially decomposed needles, leaves, and twigs.
E—0 to 4 inches; light brownish gray (10YR 6/2) very cobbly loam, dark grayish brown (10YR 4/2) moist; weak medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; common medium roots and many fine and very fine roots; 25 percent rounded cobbles and 15 percent rounded pebbles; neutral (pH 7.2); clear wavy boundary.
E/Bt—4 to 14 inches; 80 percent pale brown (10YR 6/3) very cobbly sandy clay loam, dark grayish brown (10YR 4/2) moist (E part); 20 percent grayish brown (10YR 5/2) very cobbly sandy clay loam, dark grayish brown (10YR 4/2) moist (Bt part); moderate medium granular structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots and few medium and coarse roots; few faint clay films on faces of peds (Bt part); 25 percent rounded cobbles and 25 percent rounded pebbles; neutral (pH 7.0); clear wavy boundary.
Bt1—14 to 28 inches; brown (10YR 5/3) very cobbly sandy clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots and few medium and coarse roots; common very fine pores; many distinct clay films on faces of peds and bridging sand grains; 30 percent rounded cobbles and 25 percent rounded pebbles; neutral (pH 7.3); gradual wavy boundary.
Bt2—28 to 49 inches; brown (10YR 5/3) very cobbly sandy clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots and few medium and coarse roots; common very fine pores; many distinct clay films on faces of peds and bridging sand grains; 30 percent rounded cobbles and 30 percent rounded pebbles; neutral (pH 6.8); gradual wavy boundary.
BC—49 to 60 inches; yellowish brown (10YR 5/4) very cobbly sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine roots; few very fine pores; 40 percent rounded cobbles and 20 percent rounded pebbles; neutral (pH 6.6).

Range in Characteristics

Soil temperature: 36 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 6 to 18 inches
Percent of surface covered by stones/boulders: 0 to 40 percent

E horizon:
Hue—7.5YR or 10YR
Value—6 or 7 dry; 3, 4, or 5 moist
Chroma—2, 3, 4, or 5
Texture—loam or sandy loam
Clay content—8 to 27 percent
Content of rock fragments—10 to 65 percent (0 to 35 percent cobbles and stones, 10 to 30 percent pebbles)
Reaction—pH 5.6 to 7.3

E/Bt horizon:
Hue—10YR or 7.5YR
Value—6 or 7 dry, 3, 4, or 5 moist (E part); 5 or 6 dry, 4 or 5 moist (Bt part)
Chroma—2, 3, 4, 5, or 6
Texture (mixed)—loam, sandy clay loam, or clay loam
Clay content—15 to 27 percent
Content of rock fragments—20 to 60 percent (0 to 35 percent cobbles and stones, 10 to 35 percent pebbles)
Reaction—pH 5.6 to 7.3

Bt horizon:
Hue—2.5Y, 10YR, or 7.5YR
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2, 3, 4, 5, or 6
Texture—loam, clay loam, or sandy clay loam
Clay content—18 to 35 percent
Content of rock fragments—35 to 65 percent (0 to 35 percent cobbles and stones, 25 to 45 percent pebbles)
Reaction—pH 5.6 to 7.3

BC horizon:
Hue—2.5Y, 10YR, or 7.5YR
Value—5, 6, or 7 dry; 4, 5, or 6 moist
Chroma—3, 4, or 6
Texture—sandy loam, loam, or sandy clay loam
Clay content—10 to 25 percent
Content of rock fragments—35 to 80 percent (5 to 40 percent cobbles and stones, 20 to 45 percent pebbles)
Reaction—pH 5.6 to 7.3

Yetull Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Somewhat excessively drained
Permeability: Rapid (6.0 to 20.0 inches per hour)
Landform: Alluvial fans and hills
Parent material: Sandy alluvium and eolian deposits
Slope range: 2 to 35 percent
Elevation range: 4,200 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Mixed, frigid Aridic Ustipsamments

Typical Pedon

Yetull loamy fine sand, in an area of Yetull-Yetull, stony, complex, 8 to 35 percent slopes, in rangeland, 2,400 feet north and 1,210 feet west of the southeast corner of sec. 10, T. 3 N., R. 4 W.

A—0 to 7 inches; dark yellowish brown (10YR 4/4) loamy fine sand, very dark grayish brown (10YR 3/2) moist; single grain; soft, loose, nonsticky and nonplastic; many fine and very fine roots; neutral (pH 6.6); clear wavy boundary.
C1—7 to 27 inches; yellowish brown (10YR 5/4) loamy fine sand, dark brown (10YR 3/3) moist; single grain; loose, nonsticky and nonplastic; many fine and very fine roots and few medium roots; slightly alkaline (pH 7.4); gradual wavy boundary.
C2—27 to 60 inches; light yellowish brown (10YR 6/4) loamy fine sand, yellowish brown (10YR 5/4) moist; single grain; loose, nonsticky and nonplastic; common fine and very fine roots; slightly effervescent; slightly alkaline (pH 7.6).

Range in Characteristics

Soil temperature: 42 to 46 degrees
Moisture control section: Between the depths of 12 and 35 inches
Percent of surface covered by stones: 0 to 0.1 percent

A horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 3 or 4 moist
Chroma—2, 3, or 4
Clay content—0 to 10 percent
Content of rock fragments—0 to 35 percent (0 to 10 percent cobbles, 0 to 25 percent pebbles)
Reaction—pH 6.6 to 7.8

C horizon:
Hue—10YR or 2.5Y
Value—4, 5, or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—loamy sand or loamy fine sand
Clay content—0 to 10 percent
Content of rock fragments—0 to 15 percent pebbles
Calcium carbonate equivalent—0 to 5 percent
Reaction—pH 7.4 to 8.4

Ymark Series

Depth class: Deep (40 to 60 inches)
Drainage class: Well drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Alluvial fans, ridges, and side slopes of hills and mountains
Parent material: Colluvium derived from hard, fine grained igneous rock and granite deposited over hard granite bedrock
Slope range: 15 to 60 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 90 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Haplustalfs

Typical Pedon

Ymark very cobbly sandy loam, in an area of Ymark, very bouldery-Elmark, very bouldery-Rock outcrop

complex, 25 to 60 percent slopes; in a forested area, 500 feet north and 350 feet east of the southwest corner of sec. 3, T. 8 N., R. 4 W.

Oi—1 inch to 0; forest litter of partially decomposed needles, twigs, and leaves.
A—0 to 6 inches; dark grayish brown (10YR 4/2) very cobbly sandy loam, very dark gray (10YR 3/1) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots and few fine and medium roots; many very fine and few fine pores; 15 percent cobbles and 25 percent pebbles; neutral (pH 7.1); clear smooth boundary.
Bt1—6 to 10 inches; brown (10YR 5/3) very cobbly sandy clay loam, brown (10YR 4/3) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots and few fine and medium roots; many very fine and few fine pores; few faint clay films on faces of peds and bridging sand grains; 15 percent cobbles and 25 percent pebbles; neutral (pH 6.8); clear smooth boundary.
Bt2—10 to 22 inches; yellowish brown (10YR 5/4) very cobbly sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium prismatic structure parting to moderate medium and fine subangular blocky; slightly hard, friable, moderately sticky and slightly plastic; many very fine roots and few fine, medium, and coarse roots; many very fine and few fine pores; many faint clay films on faces of peds and bridging sand grains; 30 percent cobbles and 20 percent pebbles; slightly acid (pH 6.2); clear wavy boundary.
Bt3—22 to 36 inches; yellowish brown (10YR 5/4) very cobbly sandy clay loam, brown (10YR 4/3) moist; moderate medium and fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine roots and few fine and medium roots; many very fine and few fine pores; many faint clay films bridging sand grains; 30 percent cobbles and 20 percent pebbles; neutral (pH 6.8); clear wavy boundary.
BC—36 to 44 inches; yellowish brown (10YR 5/6) very cobbly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine roots and few fine and medium roots; many very fine and few fine pores; 10 percent stones, 25 percent cobbles, and 20 percent pebbles; neutral (pH 6.9); clear wavy boundary.
Cr—44 to 58 inches; olive (5Y 5/3), decomposed granite bedrock (grus) that crushes to very gravelly loamy coarse sand.
R—58 inches; hard granite bedrock.

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 6 to 12 inches
Depth to Cr horizon: 40 to 58 inches
Depth to R layer: 43 to 60 inches
Percent of surface covered by boulders: 0.01 to 3.0 percent

A horizon:
- Hue—10YR or 2.5Y
- Value—4 or 5 dry; 2 or 3 moist
- Chroma—1, 2, or 3
- Clay content—10 to 20 percent
- Content of rock fragments—20 to 50 percent (0 to 20 percent stones and cobbles, 15 to 35 percent pebbles)
- Reaction—pH 6.6 to 7.3

Bt horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2, 3, or 4
- Texture—sandy loam, sandy clay loam, or clay loam
- Clay content—18 to 30 percent
- Content of rock fragments—35 to 60 percent (5 to 30 percent stones and cobbles, 20 to 40 percent pebbles)
- Reaction—pH 6.1 to 7.3

BC horizon:
- Hue—10YR or 2.5Y
- Value—5 or 6 dry; 4 or 5 moist
- Chroma—2, 3, 4, or 6
- Texture—loamy sand, coarse sandy loam, or sandy loam
- Clay content—10 to 20 percent
- Content of rock fragments—35 to 70 percent (5 to 35 percent stones and cobbles, 20 to 45 percent pebbles)
- Reaction—pH 6.1 to 7.3

Yreka Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Moderately slow (0.2 to 0.6 inch per hour)
Landform: Alluvial fans, ridges, and side slopes of hills and mountains

Parent material: Colluvium derived from mixed rock sources
Slope range: 15 to 70 percent
Elevation range: 4,400 to 6,000 feet
Annual precipitation: 15 to 19 inches
Annual air temperature: 36 to 40 degrees F
Frost-free period: 90 to 105 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, frigid Typic Haplustalfs

Typical Pedon

Yreka gravelly loam, in an area of Yreka, bouldery-Hoyt, bouldery-Shaboom, very bouldery, complex, 15 to 45 percent slopes; in a forested area, 800 feet north and 400 feet west of the southeast corner of sec. 34, T. 9 N., R. 2 W.

Oi—1 inch to 0; forest litter of partially decomposed twigs and needles.
A—0 to 3 inches; dark grayish brown (10YR 4/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; 15 percent granite pebbles; slightly acid (pH 6.3); clear smooth boundary.
E—3 to 12 inches; brown (10YR 5/3) gravelly loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine and very fine roots and common medium roots; many very fine and fine pores; 5 percent cobbles and 20 percent pebbles; slightly acid (pH 6.5); clear smooth boundary.
Bt1—12 to 18 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; slightly hard, friable, moderately sticky and slightly plastic; many very fine and fine roots and common medium and coarse roots; few faint clay films on faces of peds and bridging sand grains; 10 percent cobbles and 30 percent pebbles; slightly acid (pH 6.1); clear smooth boundary.
Bt2—18 to 30 inches; light yellowish brown (2.5Y 6/4) very gravelly clay loam, light olive brown (2.5Y 5/4) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine, medium, and coarse roots; common very fine and fine pores; few faint clay films on faces of peds and bridging sand grains; 5 percent stones, 10 percent cobbles, and 35 percent pebbles; slightly acid (pH 6.5); gradual wavy boundary.
C—30 to 60 inches; brownish yellow (10YR 6/6) very gravelly fine sandy loam, yellowish brown (10YR 5/6) moist; massive; soft, very friable, slightly sticky and nonplastic; few very fine and fine roots; common very fine pores; 15 percent cobbles and 35 percent pebbles; slightly acid (pH 6.4).

Range in Characteristics

Soil temperature: 38 to 42 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bt horizon: 9 to 18 inches
Percent of surface covered by stones/boulders: 0 to 3 percent

A horizon:
Value—4 or 5 dry; 3 or 4 moist
Chroma—2 or 3
Texture—loam, sandy clay loam, or coarse sandy loam
Clay content—8 to 27 percent
Content of rock fragments—15 to 60 percent (5 to 25 percent cobbles and stones, 15 to 35 percent pebbles)
Reaction—pH 5.6 to 7.3

E horizon:
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2 or 3
Texture—loam, sandy clay loam, or coarse sandy loam
Clay content—8 to 27 percent
Content of rock fragments—15 to 50 percent (5 to 25 percent cobbles and stones, 15 to 35 percent pebbles)
Reaction—pH 5.6 to 7.3

Bt horizon:
Hue—2.5Y, 10YR, or 7.5YR
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, or 4
Texture—loam, clay loam, or sandy clay loam
Clay content—25 to 35 percent
Content of rock fragments—35 to 60 percent (5 to 25 percent cobbles and stones, 30 to 35 percent pebbles)
Reaction—pH 5.6 to 7.3

C horizon:
Hue—2.5Y, 10YR, or 7.5YR
Value—5 or 6 dry; 4 or 5 moist
Chroma—2, 3, 4, 5, or 6
Texture—sandy clay loam, clay loam, or fine sandy loam
Clay content—18 to 30 percent
Content of rock fragments—35 to 60 percent (5 to 25 percent cobbles and stones, 30 to 35 percent pebbles)

Reaction—pH 5.6 to 7.3

Zatony Series

Depth class: Very deep (greater than 60 inches)
Drainage class: Well drained
Permeability: Slow (0.06 to 0.2 inch per hour)
Landform: Alluvial fans, stream terraces, flood-plain steps, and drainageways
Parent material: Alluvium derived mainly from semiconsolidated shale
Slope range: 0 to 8 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Fine, mixed, superactive, frigid Aridic Haplustepts

Typical Pedon

Zatony clay loam, 0 to 2 percent slopes, in cropland, 800 feet east and 1,650 feet south of the northwest corner of sec. 21, T. 2 N., R. 1 W.

Ap1—0 to 1 inch; light brownish gray (10YR 6/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; massive; hard, firm, moderately sticky and moderately plastic; common very fine and few fine roots; many very fine vesicular pores; moderately alkaline (pH 8.2); abrupt smooth boundary.
Ap2—1 to 6 inches; light brownish gray (10YR 6/2) clay loam, dark grayish brown (10YR 4/2) moist; weak medium granular structure; slightly hard, friable, moderately sticky and moderately plastic; common very fine roots; many very fine pores; moderately alkaline (pH 8.3); gradual wavy boundary.
Bknz1—6 to 20 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; weak medium prismatic structure; hard, friable, moderately sticky and moderately plastic; common very fine roots; many very fine pores; common medium masses and seams of soluble salts; disseminated lime, few fine threads of lime; strongly effervescent; strongly alkaline (pH 9.0); gradual irregular boundary.
Bknz2—20 to 36 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; weak coarse prismatic structure; hard, friable, moderately sticky and moderately plastic; few very fine roots; common very fine pores; common medium masses and seams of soluble salts; disseminated lime, few fine threads of lime; violently effervescent; very strongly alkaline (pH 9.6); gradual irregular boundary.
Bknz3—36 to 60 inches; light gray (10YR 7/2) silty clay, brown (10YR 5/3) moist; massive; hard, firm, moderately sticky and moderately plastic; many medium soft masses and seams of soluble salts; disseminated lime, few fine threads of lime; strongly effervescent; strongly alkaline (pH 8.6).

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the depths of 4 and 12 inches
Depth to Bknz1 horizon: 3 to 8 inches
Note: A wet phase is recognized. This phase has a water table at a depth of 24 to 42 inches for brief periods during spring and early summer.

A horizon:
Hue—10YR or 2.5Y
Value—5 or 6 dry
Chroma—2 or 3
Texture (mixed)—clay loam or silt loam
Clay content—20 to 40 percent
Calcium carbonate equivalent—0 to 5 percent
Electrical conductivity—2 to 16 mmhos/cm
Sodium adsorption ratio—4 to 20
Reaction—pH 7.4 to 9.0

Bknz1 and Bknz2 horizons:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2 or 3
Texture—clay loam, silty clay loam, silty clay, or clay
Clay content—35 to 45 percent
Calcium carbonate equivalent—3 to 15 percent
Electrical conductivity—16 to 32 mmhos/cm
Sodium adsorption ratio—13 to 60
Reaction—pH 7.9 to 9.6

Bknz3 horizon:
Hue—10YR or 2.5Y
Value—5, 6, or 7 dry; 4 or 5 moist
Chroma—2 or 3
Texture—clay loam, silty clay loam, silty clay, or clay
Clay content—28 to 45 percent
Calcium carbonate equivalent—2 to 10 percent
Electrical conductivity—16 to 32 mmhos/cm
Sodium adsorption ratio—13 to 40
Reaction—pH 7.9 to 9.0

Zbart Series

Depth class: Very shallow (3 to 10 inches)
Drainage class: Somewhat excessively drained
Permeability: Moderate (0.6 inch to 2.0 inches per hour)
Landform: Escarpments, ridges, interfluves, and side slopes of hills
Parent material: Residuum derived from hard, fractured shale or argillite
Slope range: 4 to 70 percent
Elevation range: 3,800 to 5,000 feet
Annual precipitation: 10 to 14 inches
Annual air temperature: 40 to 44 degrees F
Frost-free period: 90 to 115 days

Taxonomic classification: Loamy-skeletal, mixed, superactive, nonacid, frigid Aridic Lithic Ustorthents

Typical Pedon

Zbart very channery loam, in an area of Zbart-Rock outcrop association, 25 to 70 percent slopes, in rangeland, 50 feet south and 925 feet west of the northeast corner of sec. 36, T. 2 N., R. 3 W.

A—0 to 7 inches; dark grayish brown (2.5Y 4/2) very channery loam, dark olive gray (5Y 3/2) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; 5 percent flagstones and 40 percent shale channers; slightly acid (pH 6.4); clear wavy boundary.
R—7 inches; gray (5Y 5/1), hard, fractured shale.

Range in Characteristics

Soil temperature: 42 to 46 degrees F
Moisture control section: Between the surface and a depth of 7 inches
Depth to bedrock: 5 to 10 inches
Note: The A horizon is lithochromic.

A horizon:
Value—4 or 5 dry
Clay content—15 to 27 percent
Content of rock fragments—35 to 60 percent (0 to 15 percent flagstones, 35 to 50 percent channers)
Reaction—pH 6.1 to 7.3

Detailed Soil Map Units

The map units delineated on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are listed in the map unit descriptions under the heading “additional components.” A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Amesha silt loam, 4 to 8 percent slopes, is a phase of the Amesha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Fairway-Meadowcreek complex, 0 to 2 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps.

Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Rock outcrop-Whitlash, bouldery, association, 35 to 70 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Wetsand, Cardwell, and Clunton soils, 0 to 2 percent slopes, channeled, is an undifferentiated group in this survey area.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. The map unit Dumps, mine, is an example.

The acreage and proportionate extent of each map unit is given in the table “Acreage and Proportionate Extent of the Soils,” which is at the end of the section “Formation and Classification of the Soils.” Other tables (see Contents in Part II of this survey) give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

1—Riverwash

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Riverwash

Extent: 85 percent of the map unit
Definition: Riverwash is unstabilized sandy, silty, clayey, or gravelly sediment that is flooded, washed, and reworked frequently by rivers and creeks.

Additional Components

Riverrun and similar soils: 4 percent of the unit
Wetsand and similar soils: 4 percent of the unit
Handke and similar soils: 3 percent of the unit
Pieriver and similar soils: 3 percent of the unit
Clunton and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2—Rubble land-Rock outcrop association

Map Unit Setting

Landscape: Mountains, uplands, foothills
Elevation: 3,800 to 7,000 feet
Mean annual precipitation: 10 to 24 inches
Frost-free period: 50 to 115 days

Component Description

Rubble land

Extent: 45 percent of the map unit
Definition: Rubble land consists of areas of cobbles, stones, and boulders. Commonly, it occurs at the base of mountains, hills, and escarpments, but in some areas it consists of deposits of cobbles, stones, and boulders left on mountain slopes by glaciation.

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary, metamorphic, and fine grained volcanic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Cheadle and similar soils: 5 percent of the unit
Elve and similar soils: 5 percent of the unit
Redfern and similar soils: 5 percent of the unit
Tigeron and similar soils: 4 percent of the unit
Rencot and similar soils: 3 percent of the unit
Shawmut and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

3—Dumps, mine

Component Description

Dumps, mine

Extent: 100 percent of the map unit
Definition: Mine dumps are piles of waste rock,

generally in the vicinity of active mining sites, or they are remnants of earlier mining activity.

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

4—Bronec, Clunton, channeled, and Amesha soils, 0 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands, river valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 1 to 8 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Clunton and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Flooding: Frequent
Water table: Within a depth of 60 inches
Ponding duration: Brief
Available water capacity: Mainly 9.7 inches

Amesha and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 1 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Amesha, cobbly, and similar soils: 3 percent of the unit
Bronec, very stony, and similar soils: 3 percent of the unit
Sappington and similar soils: 3 percent of the unit
Havre and similar soils: 2 percent of the unit
Meadowcreek and similar soils: 2 percent of the unit
Wetsand and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

5—Borrow areas and gravel pits

Component Description

Borrow areas

Extent: 50 percent of the map unit
Definition: Borrow areas are pits or linear excavations created primarily for the purpose of extracting materials for road building.

Gravel pits

Extent: 50 percent of the map unit
Definition: Gravel pits are pits or linear excavations made primarily for the purpose of obtaining gravel for road building.

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

6—Wetsand, Cardwell, and Clunton soils, 0 to 2 percent slopes, channeled

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Wetsand and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Gravelly sandy loam
Restrictive feature: None noted
Drainage class: Poorly drained
Parent material: Loamy alluvium over sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: Frequent
Water table: Within a depth of 60 inches
Available water capacity: Mainly 2.9 inches

Cardwell and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-silty alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Frequent
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.8 inches

Clunton and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Frequent
Water table: Within a depth of 60 inches
Ponding duration: Brief
Available water capacity: Mainly 9.7 inches

Additional Components

Riverrun and similar soils: 4 percent of the unit
Pieriver and similar soils: 3 percent of the unit
Wetsand loam and similar soils: 2 percent of the unit
Handke and similar soils: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

9—Bronec, Riverrun, channeled, and Amesha soils, 0 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands, river valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Bronec and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 1 to 8 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Riverrun and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Gravelly sandy loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland

Frequency of flooding: Occasional
Water table: Within a depth of 60 inches
Available water capacity: Mainly 2.1 inches

Amesha and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 1 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Bronec, very stony, and similar soils: 4 percent of the unit
Amesha soils that have slopes of more than 8 percent: 3 percent of the unit
Pieriver and similar soils: 3 percent of the unit
Vendome and similar soils: 3 percent of the unit
Redfist and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

11B—Amesha silt loam, 1 to 4 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 1 to 4 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.1 inches

Additional Components

Anamac and similar soils: 3 percent of the unit
Musselshell and similar soils: 3 percent of the unit
Brocko and similar soils: 2 percent of the unit
Bronec and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

11C—Amesha silt loam, 4 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 4 to 8 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.1 inches

Additional Components

Bronec and similar soils: 3 percent of the unit
Delpoint and similar soils: 3 percent of the unit
Sappington and similar soils: 2 percent of the unit
Amesha soils that have slopes of more than 8 percent: 1 percent of the unit
Brocko and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

11D—Amesha silt loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 8 to 15 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.1 inches

Additional Components

Amesha soils that have slopes of more than 15 percent: 3 percent of the unit
Bronec and similar soils: 3 percent of the unit
Brocko and similar soils: 2 percent of the unit
Kalsted and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

13A—Anamac loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, uplands, river valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Anamac and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, fine-loamy alluvium or Tertiary valley fill
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.8 inches

Additional Components

Anamac soils that have slopes of more than 2 percent: 2 percent of the unit
Brocko and similar soils: 2 percent of the unit
Cozberg and similar soils: 2 percent of the unit
Floweree and similar soils: 2 percent of the unit
Trudau and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

13C—Anamac loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Anamac and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, fine-loamy alluvium or Tertiary valley fill
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.8 inches

Additional Components

Bronec and similar soils: 3 percent of the unit

Amesha and similar soils: 2 percent of the unit
Anamac, cobbly, and similar soils: 2 percent of the unit
Sixbeacon and similar soils: 2 percent of the unit
Brocko and similar soils: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

18A—Brocko silt loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Brocko and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, ridges
Slope: 0 to 2 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-silty, calcareous alluvium
Coarse-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 11.8 inches

Additional Components

Brocko soils that have slopes of more than 2 percent: 3 percent of the unit
Amesha and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

18C—Brocko silt loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Brocko and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, ridges
Slope: 2 to 8 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-silty, calcareous alluvium
Coarse-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 11.8 inches

Additional Components

Bronec and similar soils: 2 percent of the unit
Brocko soils that have slopes of more than 8 percent: 1 percent of the unit
Cabbart and similar soils: 1 percent of the unit
Kalsted and similar soils: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

18D—Brocko silt loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Brocko and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, ridges
Slope: 8 to 15 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-silty, calcareous alluvium
Coarse-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 11.8 inches

Additional Components

Bronec and similar soils: 4 percent of the unit
Amesha and similar soils: 3 percent of the unit
Rencot and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

18E—Brocko silt loam, 15 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Brocko and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-silty, calcareous alluvium
Coarse-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 11.8 inches

Additional Components

Bronec and similar soils: 5 percent of the unit
Amesha and similar soils: 4 percent of the unit
Crago and similar soils: 2 percent of the unit
Rencot and similar soils: 2 percent of the unit
Rock outcrop: 1 percent of the unit
Zbart and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

20C—Windham gravelly loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Windham and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Additional Components

Maiden and similar soils: 4 percent of the unit
Judell and similar soils: 3 percent of the unit
Lap and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

20D—Windham gravelly loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Windham and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Additional Components

Maiden and similar soils: 4 percent of the unit
Judell and similar soils: 3 percent of the unit
Lap and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit
Wimper and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

20E—Windham very gravelly loam, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Windham and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.9 inches

Additional Components

Maiden and similar soils: 4 percent of the unit
Judell and similar soils: 3 percent of the unit
Wimper and similar soils: 3 percent of the unit
Windham, gravelly, and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

21A—Mckenton silty clay loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 90 to 115 days

Component Description

Mckenton and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Silty clay loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Saline and sodic, clayey recent alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 6.3 inches

Additional Components

Bonebasin and similar soils: 2 percent of the unit
Clunton and similar soils: 2 percent of the unit
Fairway and similar soils: 2 percent of the unit
Meadowcreek and similar soils: 2 percent of the unit
Wetsand and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

22C—Zatony clay loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands, river valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Zatony and similar soils

Extent: 85 percent of the map unit

Geomorphic position: Alluvial fans, drainageways, flood-plain steps, terraces
Slope: 2 to 8 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Saline and sodic, clayey alluvium derived from shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 4.4 inches

Additional Components

Ethridge and similar soils: 4 percent of the unit
Kobarter and similar soils: 4 percent of the unit
Trudau and similar soils: 4 percent of the unit
Floweree and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

23A—Mckenton silt loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 90 to 115 days

Component Description

Mckenton and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Saline and sodic, clayey recent alluvium
Native plant cover type: Rangeland
Frequency of flooding: Occasional
Water table: Within a depth of 60 inches
Ponding duration: Brief
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 6.4 inches

Additional Components

Bonebasin and similar soils: 2 percent of the unit
Clunton and similar soils: 2 percent of the unit
Fairway and similar soils: 2 percent of the unit
Meadowcreek and similar soils: 2 percent of the unit
Wetsand and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

25C—Cozberg sandy loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Cozberg and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 2 to 8 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Coarse-loamy alluvium over sandy and gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Brocko and similar soils: 4 percent of the unit
Anamac and similar soils: 2 percent of the unit
Chinook and similar soils: 2 percent of the unit
Floweree and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

26C—Crago gravelly loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Additional Components

Amesha and similar soils: 2 percent of the unit
Brocko and similar soils: 2 percent of the unit
Bronec and similar soils: 2 percent of the unit
Kalsted and similar soils: 2 percent of the unit
Musselshell and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

26D—Crago gravelly loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Additional Components

Amesha and similar soils: 2 percent of the unit
Brocko and similar soils: 2 percent of the unit
Bronec and similar soils: 2 percent of the unit
Kalsted and similar soils: 2 percent of the unit
Musselshell and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

26E—Crago gravelly loam, 15 to 25 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 15 to 25 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Additional Components

Musselshell and similar soils: 5 percent of the unit
Bronec and similar soils: 4 percent of the unit
Amesha and similar soils: 2 percent of the unit

Brocko and similar soils: 2 percent of the unit
Kalsted and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

27A—Bronec gravelly loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 0 to 2 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.3 inches

Additional Components

Bronec, stony, and similar soils: 3 percent of the unit
Amesha and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

27C—Bronec gravelly loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.3 inches

Additional Components

Amesha and similar soils: 3 percent of the unit
Bronec, very stony, and similar soils: 3 percent of the unit
Bronec, cobbly, and similar soils: 2 percent of the unit
Geohrock and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

27D—Bronec gravelly loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium

Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.3 inches

Additional Components

Amesha and similar soils: 6 percent of the unit
Geohrock and similar soils: 4 percent of the unit
Sappington and similar soils: 3 percent of the unit
Bronec, very stony, and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

27E—Bronec gravelly loam, 15 to 35 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.3 inches

Additional Components

Amesha and similar soils: 6 percent of the unit
Sappington and similar soils: 4 percent of the unit
Geohrock and similar soils: 3 percent of the unit
Bronec, very stony, and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

30A—Dougcliff mucky peat, 0 to 1 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, river valleys, valleys
Elevation: 3,800 to 6,500 feet
Mean annual precipitation: 10 to 19 inches
Frost-free period: 80 to 115 days

Component Description

Dougcliff and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps, swales on terraces
Slope: 0 to 1 percent
Surface layer texture: Mucky peat
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Organic, herbaceous material over fine-silty alluvium
Native plant cover type: Rangeland
Flooding: None
Water table: Within a depth of 60 inches
Ponding duration: Brief
Available water capacity: Mainly 20.7 inches

Additional Components

Clunton and similar soils: 5 percent of the unit
Meadowcreek and similar soils: 4 percent of the unit
Fairway and similar soils: 3 percent of the unit
Riverrun and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

32A—Fairway silt loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, river valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Fairway and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 10.6 inches

Additional Components

Meadowcreek and similar soils: 3 percent of the unit
Clunton and similar soils: 2 percent of the unit
Faith and similar soils: 2 percent of the unit
Riverrun and similar soils: 2 percent of the unit
Handke and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

33E—Geohrock cobbly clay loam, 15 to 35 percent slopes, stony

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Geohrock and similar soils

Extent: 80 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 15 to 35 percent
Surface layer texture: Cobbly clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly Tertiary valley fill alluvium
Gravelly slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Additional Components

Bronec and similar soils: 4 percent
Lahood and similar soils: 4 percent
Rencot and similar soils: 4 percent
Rock outcrop: 3 percent
Sappington and similar soils: 3 percent
Varney and similar soils: 2 percent

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

37A—Pieriver silt loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Pieriver and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy recent alluvium derived from mixed rock sources
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.5 inches

Additional Components

Cardwell and similar soils: 3 percent of the unit
Handke and similar soils: 3 percent of the unit
Riverrun and similar soils: 3 percent of the unit
Fairway and similar soils: 2 percent of the unit
Nestley and similar soils: 2 percent of the unit
Wetsand and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

38C—Kalsted sandy loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Kalsted and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges, terraces
Slope: 2 to 8 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, coarse-loamy alluvium
Calcareous, coarse-loamy colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.9 inches

Additional Components

Amesha and similar soils: 2 percent of the unit
Cozberg and similar soils: 2 percent of the unit
Crago and similar soils: 2 percent of the unit
Kalsted and similar soils: 2 percent of the unit
Roto and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

38D—Kalsted sandy loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Kalsted and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges, terraces
Slope: 8 to 15 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, coarse-loamy alluvium
Calcareous, coarse-loamy colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.9 inches

Additional Components

Amesha and similar soils: 4 percent of the unit
Cozberg and similar soils: 3 percent of the unit
Bronec and similar soils: 2 percent of the unit
Crago and similar soils: 2 percent of the unit
Kalsted, stony, and similar soils: 2 percent of the unit
Roto and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

40A—Moltoner loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,400 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 90 to 115 days

Component Description

Moltoner and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Poorly drained
Parent material: Saline and sodic, fine-loamy, stratified recent alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 6.6 inches

Additional Components

Cardwell and similar soils: 3 percent of the unit

Ledger and similar soils: 3 percent of the unit
Clunton and similar soils: 2 percent of the unit
Wetsand and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

41—Bronec, Amesha, and Riverrun, channeled, soils, 0 to 35 percent slopes

Map Unit Setting

Landscape: Valleys, uplands, river valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 1 to 35 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Amesha and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 1 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Riverrun and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Gravelly sandy loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Occasional
Water table: Within a depth of 60 inches
Available water capacity: Mainly 2.1 inches

Additional Components

Bronec, very stony, and similar soils: 5 percent of the unit
Amesha, cobbly, and similar soils: 4 percent of the unit
Geohrock and similar soils: 4 percent of the unit
Sappington and similar soils: 4 percent of the unit
Wetsand and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

42D—Perma cobbly loam, 4 to 15 percent slopes, stony

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Perma and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics

Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.4 inches

Additional Components

Wimper and similar soils: 4 percent of the unit
Hilger and similar soils: 3 percent of the unit
Shawmut and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

42E—Perma cobbly loam, 15 to 25 percent slopes, stony

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Perma and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 15 to 25 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.4 inches

Additional Components

Shawmut and similar soils: 5 percent of the unit
Blaincreek and similar soils: 4 percent of the unit
Hilger and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

47A—Cardwell silty clay loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 6,000 feet
Mean annual precipitation: 10 to 19 inches
Frost-free period: 80 to 115 days

Component Description

Cardwell and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Silty clay loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-silty alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 6.0 inches

Additional Components

Pieriver and similar soils: 4 percent of the unit
Eagleton and similar soils: 3 percent of the unit
Nestley and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

48A—Riverrun sandy loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 90 to 115 days

Component Description

Riverrun and similar soils

Extent: 85 percent of the map unit

Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Occasional
Water table: Within a depth of 60 inches
Available water capacity: Mainly 2.2 inches

Additional Components

Clunton and similar soils: 4 percent of the unit
Pieriver and similar soils: 4 percent of the unit
Riverwash: 3 percent of the unit
Handke and similar soils: 2 percent of the unit
Meadowcreek and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

52A—Ryell loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Ryell and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Coarse-loamy over sandy and gravelly recent alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.7 inches

Additional Components

Havre and similar soils: 3 percent of the unit
Pieriver and similar soils: 3 percent of the unit
Riverrun and similar soils: 3 percent of the unit
Cardwell and similar soils: 2 percent of the unit
Fairway and similar soils: 2 percent of the unit
Nestley and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

53C—Sappington gravelly clay loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sappington and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Gravelly clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.9 inches

Additional Components

Amesha and similar soils: 3 percent of the unit
Sappington soils that have slopes of more than 8 percent: 3 percent of the unit
Geohrock and similar soils: 2 percent of the unit
Varney and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

56A—Trudau loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Trudau and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, flood-plain steps, knolls, stream terraces, terraces
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Saline and sodic, fine-loamy alluvium derived from shale
Native plant cover type: Rangeland
Flooding: None
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 6.0 inches

Additional Components

Trudau clay loam and similar soils: 5 percent of the unit
Bronec and similar soils: 4 percent of the unit
Chinook and similar soils: 3 percent of the unit
Zatony and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

56B—Trudau loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: River valleys, valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Trudau and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, flood-plain steps, knolls, stream terraces, terraces
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Saline and sodic, fine-loamy alluvium derived from shale
Native plant cover type: Rangeland
Flooding: None
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 6.0 inches

Additional Components

Trudau clay loam and similar soils: 5 percent of the unit
Bronec and similar soils: 3 percent of the unit
Zatony and similar soils: 3 percent of the unit
Abor and similar soils: 2 percent of the unit
Chinook and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

60C—Watne loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Watne and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, interfluves, knolls
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from claystone
Fine-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.3 inches

Additional Components

Watne soils that have slopes of more than 8 percent: 5 percent of the unit
Martinsdale and similar soils: 4 percent of the unit
Shawmut and similar soils: 3 percent of the unit
Wimper and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

64A—Varney sandy clay loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Varney and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 0 to 2 percent
Surface layer texture: Sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.0 inches

Additional Components

Attewan and similar soils: 4 percent of the unit
Sappington and similar soils: 4 percent of the unit
Geohrock and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

64C—Varney sandy clay loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Varney and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 2 to 8 percent
Surface layer texture: Sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.0 inches

Additional Components

Anamac and similar soils: 4 percent of the unit
Raghorn and similar soils: 4 percent of the unit
Sieben and similar soils: 3 percent of the unit
Abor and similar soils: 2 percent of the unit
Udecide and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

65C—Judell loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Judell and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from limestone
Fine-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.6 inches

Additional Components

Windham and similar soils: 5 percent of the unit
Maiden and similar soils: 3 percent of the unit
Lap and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

68D—Bondoe channery loam, 4 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bondoe and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans
Slope: 4 to 15 percent
Surface layer texture: Channery loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium derived from calcareous shale
Gravelly colluvium derived from clayey shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.8 inches

Additional Components

Benz and similar soils: 2 percent of the unit
Brocko and similar soils: 2 percent of the unit
Ethridge and similar soils: 2 percent of the unit
Rock outcrop: 2 percent of the unit
Zbart and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

69A—Meadowcreek silty clay loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 90 to 115 days

Component Description

Meadowcreek and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Silty clay loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 6.3 inches

Additional Components

Clunton and similar soils: 3 percent of the unit
Mckenton and similar soils: 3 percent of the unit
Bonebasin and similar soils: 2 percent of the unit
Wetsand and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

71C—Raghorn sandy loam, 4 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Raghorn and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls
Slope: 4 to 8 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Fine-loamy alluvium over sandy alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.1 inches

Additional Components

Varney and similar soils: 5 percent of the unit
Bronec and similar soils: 4 percent of the unit
Cozberg and similar soils: 3 percent of the unit
Yetull and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

71D—Raghorn sandy loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Raghorn and similar soils

Extent: 80 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls
Slope: 8 to 15 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Fine-loamy alluvium over sandy alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.1 inches

Additional Components

Bronec and similar soils: 7 percent of the unit
Varney and similar soils: 6 percent of the unit
Cozberg and similar soils: 4 percent of the unit
Yetull and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

72F—Zbart-Rock outcrop association, 25 to 70 percent slopes

Map Unit Setting

Landscape: Uplands, valleys, foothills
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Zbart and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 25 to 70 percent
Surface layer texture: Very channery loam
Depth to restrictive feature: 5 to 10 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Gravelly residuum derived from claystone
Gravelly residuum derived from hard, fractured shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.8 inch

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of areas of exposed hard, fractured shale bedrock. Flagstones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Bondoe and similar soils: 4 percent of the unit
Brocko and similar soils: 4 percent of the unit
Benz and similar soils: 3 percent of the unit
Crago and similar soils: 3 percent of the unit
Whitlash and similar soils: 3 percent of the unit
Windham and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

73C—Martinsdale loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Martinsdale and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived

from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Additional Components

Farnuf and similar soils: 4 percent
Martinsdale, stony, and similar soils: 3 percent
Work and similar soils: 3 percent

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

74D—Shawmut gravelly loam, 4 to 15 percent slopes, bouldery

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Shawmut and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Additional Components

Martinsdale and similar soils: 6 percent of the unit
Wickes and similar soils: 5 percent of the unit
Wimper and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

75C—Sixbeacon loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sixbeacon and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly alluvium over sandy and gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Additional Components

Anamac and similar soils: 3 percent of the unit
Sixbeacon soils that have slopes of more than 8 percent: 3 percent of the unit
Bronec and similar soils: 2 percent of the unit
Sieben and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

76A—Absay silty clay loam, 0 to 4 percent slopes

Map Unit Setting

Landscape: Valleys, uplands, river valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Absay and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, stream terraces
Slope: 0 to 4 percent
Surface layer texture: Silty clay loam

Restrictive feature: None noted
Drainage class: Well drained
Parent material: Saline, sodic, clayey alluvium derived from shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 5.8 inches

Additional Components

Ethridge and similar soils: 4 percent of the unit
Trudau and similar soils: 2 percent of the unit
Varney and similar soils: 2 percent of the unit
Zatony and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

77F—Rock outcrop-Pensore, stony-Crago, stony, association, 25 to 60 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Rock outcrop

Extent: 40 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Pensore and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, knolls, ridges, strath terraces
Slope: 25 to 60 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Crago and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Additional Components

Roto and similar soils: 4 percent of the unit
Amesha and similar soils: 2 percent of the unit
Crago soils that have slopes of less than 25 percent: 2 percent of the unit
Kalsted and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

79A—Chinook sandy loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Chinook and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, hills, terraces
Slope: 0 to 2 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained

Parent material:
Coarse-loamy alluvium
Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.3 inches

Additional Components

Amesha and similar soils: 2 percent of the unit
Cozberg and similar soils: 2 percent of the unit
Kalsted and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

79C—Chinook sandy loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Chinook and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, hills, terraces
Slope: 2 to 8 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium
Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.3 inches

Additional Components

Cozberg and similar soils: 2 percent of the unit
Raghorn and similar soils: 2 percent of the unit
Amesha and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

79D—Chinook sandy loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Chinook and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hills, terraces
Slope: 8 to 15 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium
Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.3 inches

Additional Components

Kalsted and similar soils: 4 percent of the unit
Amesha and similar soils: 2 percent of the unit
Cozberg and similar soils: 2 percent of the unit
Raghorn and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

79E—Chinook sandy loam, 15 to 25 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Chinook and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hills, terraces
Slope: 15 to 25 percent
Surface layer texture: Sandy loam

Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium
Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.3 inches

Additional Components

Kalsted and similar soils: 5 percent of the unit
Amesha and similar soils: 4 percent of the unit
Bronec and similar soils: 2 percent of the unit
Cozberg and similar soils: 2 percent of the unit
Vendome and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

80A—Floweree silt loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Floweree and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, knolls, terraces
Slope: 0 to 2 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-silty alluvium derived from semiconsolidated shale-siltstone
Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.1 inches

Additional Components

Brocko and similar soils: 3 percent of the unit
Amesha and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

80C—Floweree silt loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Floweree and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, knolls, terraces
Slope: 2 to 8 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-silty alluvium derived from semiconsolidated shale-siltstone
Fine-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.1 inches

Additional Components

Floweree soils that have slopes of more than 8 percent: 6 percent of the unit
Amesha and similar soils: 2 percent of the unit
Brocko and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

81A—Ethridge clay loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Ethridge and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, terraces
Slope: 0 to 2 percent
Surface layer texture: Clay loam

Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Clayey alluvium derived from semiconsolidated, clayey shale
Clayey slope alluvium derived from semiconsolidated, clayey shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.6 inches

Additional Components

Kobarter and similar soils: 3 percent of the unit
Varney and similar soils: 3 percent of the unit
Shoddy and similar soils: 2 percent of the unit
Udecide and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

81C—Ethridge clay loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Ethridge and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Clayey alluvium derived from semiconsolidated, clayey shale
Clayey slope alluvium derived from semiconsolidated, clayey shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.6 inches

Additional Components

Kobarter and similar soils: 5 percent of the unit
Varney and similar soils: 4 percent of the unit
Cabbart and similar soils: 2 percent of the unit
Shoddy and similar soils: 2 percent of the unit
Udecide and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

82C—Rothiemay very gravelly loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Rothiemay and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, knolls, terraces
Slope: 2 to 8 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, fine-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.9 inches

Additional Components

Bronec and similar soils: 5 percent of the unit
Amesha and similar soils: 3 percent of the unit
Sappington and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

83C—Shoddy silty clay loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Shoddy and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Hills, knolls, ridges

Slope: 2 to 8 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Calcareous, clayey residuum derived from semiconsolidated shale-siltstone
Calcareous, clayey slope alluvium over residuum derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Additional Components

Cabbart and similar soils: 4 percent of the unit
Amesha and similar soils: 3 percent of the unit
Brocko and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

83D—Shoddy silty clay loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Shoddy and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Hills, knolls, ridges
Slope: 8 to 15 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Calcareous, clayey residuum derived from semiconsolidated shale-siltstone
Calcareous, clayey slope alluvium over residuum derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Additional Components

Kobarter and similar soils: 4 percent of the unit
Amesha and similar soils: 2 percent of the unit
Brocko and similar soils: 2 percent of the unit
Crago and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

84A—Clunton-Faith-Dougcliff complex, 1 to 4 percent slopes

Map Unit Setting

Landscape: River valleys, valleys, uplands, foothills, mountains
Elevation: 3,940 to 6,500 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Clunton and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 1 to 4 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.7 inches

Faith and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, drainageways, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 10.1 inches

Dougcliff and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps, swales on terraces
Slope: 0 to 1 percent

Surface layer texture: Mucky peat
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Organic, herbaceous material over fine-silty alluvium
Native plant cover type: Rangeland
Flooding: None
Water table: Within a depth of 60 inches
Ponding duration: Brief
Available water capacity: Mainly 20.7 inches

Additional Components

Meadowcreek and similar soils: 4 percent of the unit
Cometcrik and similar soils: 3 percent of the unit
Eagleton and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

85D—Walbert coarse sandy loam, 4 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Walbert and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Hillsides, interfluves, ridges
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Parent material: Sandy residuum derived from semiconsolidated, coarse-grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Additional Components

Udecide and similar soils: 4 percent
Varney and similar soils: 4 percent
Shoddy and similar soils: 3 percent
Amesha and similar soils: 2 percent
Brocko and similar soils: 2 percent

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

87C—Kobarter clay loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Kobarter and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls
Slope: 2 to 8 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Clayey slope alluvium derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.2 inches

Additional Components

Kobarter, cobbly, and similar soils: 5 percent of the unit
Ethridge and similar soils: 4 percent of the unit
Abor and similar soils: 2 percent of the unit
Shoddy and similar soils: 2 percent of the unit
Varney and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

87D—Kobarter clay loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Kobarter and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls
Slope: 8 to 15 percent

Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Clayey slope alluvium derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.2 inches

Additional Components

Ethridge and similar soils: 5 percent of the unit
Abor and similar soils: 4 percent of the unit
Shoddy and similar soils: 3 percent of the unit
Varney and similar soils: 2 percent of the unit
Brocko and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

88C—Lahood loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, foothills, valleys
Elevation: 3,800 to 5,250 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Lahood and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 2 to 8 percent
Surface layer texture: Loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly colluvium over residuum derived from basalt
- Gravelly colluvium over residuum derived from fine grained sandstone
- Gravelly residuum derived from basalt
- Gravelly residuum derived from fine grained sandstone
- Gravelly slope alluvium over residuum derived from basalt
- Gravelly slope alluvium over residuum derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Additional Components

Whitlash and similar soils: 4 percent of the unit
Brickner and similar soils: 2 percent of the unit
Floweree and similar soils: 2 percent of the unit
Varney and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

88D—Lahood loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, foothills, valleys
Elevation: 3,800 to 5,250 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Lahood and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 8 to 15 percent
Surface layer texture: Loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly colluvium over residuum derived from basalt
- Gravelly colluvium over residuum derived from fine grained sandstone
- Gravelly residuum derived from basalt
- Gravelly residuum derived from fine grained sandstone
- Gravelly slope alluvium over residuum derived from basalt
- Gravelly slope alluvium over residuum derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Additional Components

Whitlash and similar soils: 5 percent of the unit
Rock outcrop: 4 percent of the unit

Brickner and similar soils: 2 percent of the unit
Brocko and similar soils: 2 percent of the unit
Bronec and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

92D—Clunton, Cometcrik, and Perma, stony, soils, 0 to 15 percent slopes

Map Unit Setting

Landscape: River valleys, foothills, mountains, uplands, valleys
Elevation: 3,940 to 6,500 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Clunton and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 4 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Frequent
Water table: Within a depth of 60 inches
Ponding duration: Brief
Available water capacity: Mainly 9.7 inches

Cometcrik and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Poorly drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Frequent
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.4 inches

Perma and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.4 inches

Additional Components

Clunton, cool, and similar soils: 5 percent of the unit
Meadowcreek and similar soils: 4 percent of the unit
Dougcliff and similar soils: 2 percent of the unit
Eagleton and similar soils: 2 percent of the unit
Faith and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

99D—Libeg gravelly loam, 4 to 15 percent slopes, bouldery

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Libeg and similar soils

Extent: 80 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Additional Components

Libeg silty clay loam and similar soils: 6 percent of the unit
Nieman and similar soils: 4 percent of the unit
Rock outcrop: 4 percent of the unit
Surdal and similar soils: 3 percent of the unit
Tibkey and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

99E—Libeg very gravelly loam, 15 to 35 percent slopes, bouldery

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Libeg and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Additional Components

Libeg, very bouldery, and similar soils: 5 percent of the unit
Monaberg and similar soils: 5 percent of the unit
Nieman and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

113C—Amesha-Amesha, stony, complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Amesha, stony, and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Bronec and similar soils: 6 percent of the unit

Amesha soils that have slopes of more than 8 percent: 5 percent of the unit
Sappington and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

113D—Amesha-Amesha, stony, complex, 8 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 8 to 15 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Amesha, stony, and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Crago and similar soils: 8 percent of the unit
Amesha soils that have slopes of more than 15 percent: 7 percent of the unit
Sappington and similar soils: 5 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

114D—Amesha-Crago-Shoddy complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 4 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.0 inches

Crago and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Shoddy and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hills, knolls, ridges
Slope: 4 to 15 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Calcareous, clayey residuum derived from semiconsolidated shale-siltstone
Calcareous, clayey slope alluvium over residuum derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Additional Components

Anamac and similar soils: 4 percent of the unit
Cabbart and similar soils: 4 percent of the unit
Walbert and similar soils: 3 percent of the unit
Brocko and similar soils: 2 percent of the unit
Sappington and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

114E—Amesha-Crago-Shoddy complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 15 to 45 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.0 inches

Crago and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Shoddy and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Hills, knolls, ridges
Slope: 15 to 45 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Calcareous, clayey residuum derived from semiconsolidated shale-siltstone
Calcareous, clayey slope alluvium over residuum derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Additional Components

Bronec and similar soils: 3 percent of the unit
Cabbart and similar soils: 3 percent of the unit
Walbert and similar soils: 3 percent of the unit
Anamac and similar soils: 2 percent of the unit
Brocko and similar soils: 2 percent of the unit
Sappington and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

115A—Amesha gravelly loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 0 to 2 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Bronec and similar soils: 2 percent of the unit
Sappington and similar soils: 2 percent of the unit
Geohrock and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

115C—Amesha gravelly loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Bronec and similar soils: 5 percent of the unit
Amesha soils that have slopes of more than 8 percent: 3 percent of the unit
Sappington and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

115D—Amesha gravelly loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Bronec and similar soils: 4 percent of the unit
Crago and similar soils: 4 percent of the unit

Kalsted and similar soils: 3 percent of the unit
Geohrock and similar soils: 2 percent of the unit
Sappington and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

115E—Amesha gravelly loam, 15 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Bronec and similar soils: 4 percent of the unit
Crago and similar soils: 4 percent of the unit
Kalsted and similar soils: 3 percent of the unit
Geohrock and similar soils: 2 percent of the unit
Sappington and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

116A—Amesha loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.0 inches

Additional Components

Bronec and similar soils: 2 percent of the unit
Kalsted and similar soils: 2 percent of the unit
Sappington and similar soils: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

116C—Amesha loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 9.0 inches

Additional Components

Bronec and similar soils: 3 percent of the unit
Kalsted and similar soils: 2 percent of the unit
Sappington and similar soils: 2 percent of the unit
Amesha soils that have slopes of more than 8 percent: 1 percent of the unit
Cabbart and similar soils: 1 percent of the unit
Delpoint and similar soils: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

116D—Amesha loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 8 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.0 inches

Additional Components

Bronec and similar soils: 4 percent of the unit
Amesha, stony, and similar soils: 3 percent of the unit
Sappington and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

117E—Amesha-Cabbart-Bronec cobbly loams, 4 to 25 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 4 to 15 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Cabbart and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hills, knolls
Slope: 8 to 25 percent
Surface layer texture: Cobbly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from semiconsolidated siltstone
Loamy slope alluvium over residuum derived from calcareous siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.4 inches

Bronec and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 4 to 15 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted

Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.0 inches

Additional Components

Anamac and similar soils: 4 percent of the unit
Bronec, very gravelly, and similar soils: 4 percent of the unit
Sappington and similar soils: 3 percent of the unit
Brocko and similar soils: 2 percent of the unit
Shoddy and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

118C—Amesha cobbly loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Amesha and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Bronec and similar soils: 5 percent of the unit
Sappington and similar soils: 3 percent of the unit
Amesha soils that have slopes of more than 8 percent: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

121E—Maiden-Lap-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Maiden and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.3 inches

Lap and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Judell and similar soils: 2 percent of the unit
Windham and similar soils: 2 percent of the unit
Windham, very cobbly, and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

121F—Maiden-Lap-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Maiden and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.3 inches

Lap and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Judell and similar soils: 2 percent of the unit
Windham and similar soils: 2 percent of the unit
Windham soils that have slopes of less than 35 percent: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

122D—Maiden-Lap-Windham complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Maiden and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over residuum derived from limestone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Lap and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Windham and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Additional Components

Judell and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit
Wimper and similar soils: 2 percent of the unit
Windham, very stony, and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

122E—Maiden-Lap-Windham complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Maiden and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Lap and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Windham and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Additional Components

Judell and similar soils: 5 percent of the unit
Rock outcrop: 4 percent of the unit
Wimper and similar soils: 4 percent of the unit
Windham, very stony, and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

122F—Maiden-Lap-Windham complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Maiden and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Lap and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Windham and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Additional Components

Rock outcrop: 6 percent of the unit
Windham, very stony, and similar soils: 5 percent of the unit
Maiden, very stony, and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

123E—Maiden, very stony-Rock outcrop-Lap, very stony, complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Maiden and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 15 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained

Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.7 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Lap and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Windham and similar soils: 4 percent of the unit
Lap, moist, and similar soils: 3 percent of the unit
Windham, stony, and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

123F—Maiden, very stony-Rock outcrop-Lap, very stony, complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Maiden and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.7 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Lap, cool, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Windham, very stony, and similar soils: 4 percent of the unit

Lap and similar soils: 3 percent of the unit
Windham and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

125D—Maiden-Lap-Windham complex, 4 to 15 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Maiden and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Lap and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Windham and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Additional Components

Maiden soils that have slopes of more than 15 percent: 6 percent of the unit
Windham soils that have slopes of more than 15 percent: 4 percent of the unit
Wimper and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

125E—Maiden-Lap-Windham complex, 15 to 35 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Maiden and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over residuum derived from limestone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Lap and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Windham and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Additional Components

Maiden soils that have slopes of more than 35 percent: 7 percent of the unit
Wimper and similar soils: 5 percent of the unit
Windham soils that have slopes of more than 35 percent: 5 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

126F—Maiden, very stony-Rock outcrop-Lap, very stony, complex, 35 to 60 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Maiden and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.7 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Lap and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained

Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Maiden soils that have slopes of less than 35 percent: 6 percent of the unit
Windham and similar soils: 5 percent of the unit
Wimper and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

132A—Anamac silt loam, 0 to 2 percent slopes, saline

Map Unit Setting

Landscape: Valleys, river valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Anamac and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 0 to 2 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, fine-loamy alluvium or Tertiary valley fill
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 9.1 inches

Additional Components

Trudau and similar soils: 5 percent of the unit
Ethridge and similar soils: 4 percent of the unit
Bronec and similar soils: 3 percent of the unit
Varney and similar soils: 2 percent of the unit
Brocko and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

151D—Delpoint-Abor complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Delpoint and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hills, knolls
Slope: 4 to 15 percent
Surface layer texture: Loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Fine-loamy alluvium over loamy residuum derived from semiconsolidated sandstone-siltstone
Fine-loamy residuum derived from semiconsolidated sandstone-siltstone
Fine-loamy slope alluvium over loamy residuum derived from semiconsolidated sandstone-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.0 inches

Abor and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Hills, knolls, ridges
Slope: 4 to 15 percent
Surface layer texture: Clay
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Calcareous, clayey slope alluvium over residuum derived from semiconsolidated shale-siltstone
Calcareous, clayey residuum derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.8 inches

Additional Components

Shoddy and similar soils: 6 percent of the unit
Brocko and similar soils: 5 percent of the unit
Cabbart and similar soils: 4 percent of the unit
Kobarter and similar soils: 4 percent of the unit
Amesha and similar soils: 3 percent of the unit
Ethridge and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

171D—Branham-Opitz-Tuggle complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Branham, warm, and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 2 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Sandy and gravelly residuum derived from granite
Sandy and gravelly colluvium over residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Opitz and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountain slopes, plateaus, ridges
Slope: 2 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Tuggle and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 2 to 15 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from granite
Loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.7 inches

Additional Components

Branham, moist, and similar soils: 6 percent of the unit
Caseypeak and similar soils: 5 percent of the unit
Branham loam and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

171E—Branham-Opitz-Tuggle complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Branham, warm, and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Sandy and gravelly residuum derived from granite

Sandy and gravelly colluvium over residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Opitz and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountain slopes, plateaus, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Tuggle and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from granite
Loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.7 inches

Additional Components

Branham, moist, and similar soils: 6 percent of the unit
Caseypeak and similar soils: 5 percent of the unit
Branham loam and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

172D—Branham-Clugulch-Rock outcrop complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Branham and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 2 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Sandy and gravelly residuum derived from granite
Sandy and gravelly colluvium over residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.9 inches

Clugulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 4 to 10 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.7 inch

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Caseypeak and similar soils: 5 percent of the unit

Tuggle and similar soils: 4 percent of the unit
Branham, moist, and similar soils: 3 percent of the unit
Opitz and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

172E—Branham-Clugulch-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Branham and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Sandy and gravelly residuum derived from granite
Sandy and gravelly colluvium over residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.9 inches

Clugulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 4 to 10 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.7 inch

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Tuggle and similar soils: 5 percent of the unit
Opitz and similar soils: 4 percent of the unit
Branham, moist, and similar soils: 3 percent of the unit
Caseypeak and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

173F—Branham, stony-Tuggle, very stony-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 40 to 70 days

Component Description

Branham and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 35 to 60 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Sandy and gravelly residuum derived from granite
Sandy and gravelly colluvium over residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.4 inches

Tuggle and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 35 to 60 percent
Surface layer texture: Coarse sandy loam

Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from granite
Loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.7 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Clugulch and similar soils: 6 percent of the unit
Hiore and similar soils: 5 percent of the unit
Bobowic and similar soils: 2 percent of the unit
Opitz and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

182D—Brocko-Amesha complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Brocko and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-silty, calcareous alluvium
Coarse-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 11.8 inches

Amesha and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Bronec and similar soils: 5 percent of the unit
Brocko soils that have slopes of more than 15 percent: 4 percent of the unit
Amesha soils that have slopes of more than 15 percent: 3 percent of the unit
Kalsted and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

183E—Brocko-Rock outcrop-Rencot complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Brocko and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-silty, calcareous alluvium
Coarse-silty, calcareous loess
Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 11.8 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary, metamorphic, and fine grained volcanic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Rencot and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 8 to 35 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Additional Components

Bronec and similar soils: 4 percent of the unit
Haxby and similar soils: 3 percent of the unit
Sixbeacon and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

184E—Brocko-Rock outcrop-Bronec, very stony, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Brocko and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-silty, calcareous alluvium
Coarse-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 11.8 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of areas of exposed hard, fractured shale bedrock. Flagstones litter the areas and accumulate at the base of hills and escarpments.

Bronec and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Cabbart and similar soils: 4 percent of the unit
Shoddy and similar soils: 3 percent of the unit
Haxby and similar soils: 2 percent of the unit
Rencot and similar soils: 2 percent of the unit
Sappington and similar soils: 2 percent of the unit
Sixbeacon and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

191C—Cabbart-Shoddy-Amesha complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys

Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Cabbart and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hills, knolls
Slope: 2 to 8 percent
Surface layer texture: Loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
- Loamy residuum derived from semiconsolidated siltstone
- Loamy slope alluvium over residuum derived from calcareous siltstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Shoddy and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Hills, knolls, ridges
Slope: 2 to 8 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
- Calcareous, clayey residuum derived from semiconsolidated shale-siltstone
- Calcareous, clayey slope alluvium over residuum derived from semiconsolidated shale-siltstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Amesha and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, coarse-loamy Tertiary valley fill alluvium
- Calcareous, gravelly colluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Brocko and similar soils: 5 percent of the unit
Bronec and similar soils: 4 percent of the unit
Kobarter and similar soils: 3 percent of the unit
Walbert and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

191D—Cabbart-Shoddy-Amesha complex, 8 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Cabbart and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hills, knolls
Slope: 8 to 15 percent
Surface layer texture: Loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
- Loamy residuum derived from semiconsolidated siltstone
- Loamy slope alluvium over residuum derived from calcareous siltstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Shoddy and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hills, knolls, ridges
Slope: 8 to 15 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
- Calcareous, clayey residuum derived from semiconsolidated shale-siltstone
- Calcareous, clayey slope alluvium over residuum derived from semiconsolidated shale-siltstone

Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 2.7 inches

Amesha and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Brocko and similar soils: 4 percent of the unit
Bronec and similar soils: 4 percent of the unit
Walbert and similar soils: 3 percent of the unit
Kobarter and similar soils: 2 percent of the unit
Udecide and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

191E—Cabbart-Shoddy-Amesha complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Cabbart and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hills, knolls
Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from semiconsolidated siltstone
Loamy slope alluvium over residuum derived from calcareous siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.4 inches

Shoddy and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hills, knolls, ridges
Slope: 15 to 45 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Calcareous, clayey residuum derived from semiconsolidated shale-siltstone
Calcareous, clayey slope alluvium over residuum derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Amesha and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Cabbart, very stony, and similar soils: 6 percent of the unit
Abor and similar soils: 5 percent of the unit
Sappington and similar soils: 4 percent of the unit
Delpoint and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

192C—Cabbart clay loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet

Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Cabbart and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Escarpments, hills, knolls
Slope: 2 to 8 percent
Surface layer texture: Clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from semiconsolidated siltstone
Loamy slope alluvium over residuum derived from calcareous siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.5 inches

Additional Components

Abor and similar soils: 2 percent of the unit
Brocko and similar soils: 2 percent of the unit
Bronec and similar soils: 2 percent of the unit
Delpoint and similar soils: 2 percent of the unit
Shoddy and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

193E—Cabbart-Haxby loams, 8 to 45 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Cabbart and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hills, knolls
Slope: 8 to 45 percent
Surface layer texture: Loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from semiconsolidated siltstone
Loamy slope alluvium over residuum derived from calcareous siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Haxby and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Hillsides, ridges, strath terraces
Slope: 15 to 45 percent
Surface layer texture: Loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over gravelly residuum derived from basalt
Coarse-loamy colluvium over gravelly residuum derived from fine grained sandstone
Coarse-loamy slope alluvium over gravelly residuum derived from basalt
Coarse-loamy slope alluvium over gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.4 inches

Additional Components

Bronec and similar soils: 5 percent of the unit
Amesha and similar soils: 4 percent of the unit
Chinook and similar soils: 3 percent of the unit
Kalsted and similar soils: 3 percent of the unit
Rencot and similar soils: 3 percent of the unit
Sappington and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

194E—Cabbart-Bronec, stony-Rencot, very stony, complex, 8 to 25 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Cabbart and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hills, knolls
Slope: 8 to 25 percent
Surface layer texture: Cobbly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from semiconsolidated siltstone
Loamy slope alluvium over residuum derived from calcareous siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.4 inches

Bronec and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 8 to 25 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Rencot and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 15 to 25 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Additional Components

Geohrock and similar soils: 6 percent of the unit
Sappington and similar soils: 5 percent of the unit
Amesha and similar soils: 4 percent of the unit
Sixbeacon and similar soils: 3 percent of the unit
Cabbart, very stony, and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

195E—Cabbart, very stony-Bronec, stony-Rock outcrop complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Cabbart and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hills, knolls
Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from semiconsolidated siltstone
Loamy slope alluvium over residuum derived from calcareous siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Bronec and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 8 to 25 percent

Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists of exposures of weakly consolidated sedimentary beds. These beds are primarily soft siltstone and sandstone. In places, harder layers of coarse grained sandstone cap the softer beds and form ledges. Cobble- and stone-sized fragments of sandstone accumulate at the base of escarpments and on fans at the base of hills.

Additional Components

Sappington and similar soils: 5 percent of the unit
Geohrock and similar soils: 4 percent of the unit
Amesha and similar soils: 3 percent of the unit
Brocko and similar soils: 3 percent of the unit
Haxby and similar soils: 3 percent of the unit
Rencot and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

195F—Cabbart, very stony-Rock outcrop-Bronec, very stony, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Cabbart and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hills, knolls
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from semiconsolidated siltstone
Loamy slope alluvium over residuum derived from calcareous siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists of exposures of weakly consolidated sedimentary beds. These beds are primarily soft siltstone and sandstone. In places, harder layers of coarse grained sandstone cap the softer beds and form ledges. Cobble- and stone-sized fragments of sandstone accumulate at the base of escarpments and on fans at the base of hills.

Bronec and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 25 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Additional Components

Sappington and similar soils: 5 percent of the unit
Geohrock and similar soils: 4 percent of the unit
Amesha and similar soils: 3 percent of the unit
Brocko and similar soils: 3 percent of the unit
Haxby and similar soils: 3 percent of the unit
Rencot and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

201E—Windham-Rock outcrop-Lap, very stony, complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Windham and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.1 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Lap and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Warneke and similar soils: 6 percent of the unit
Maiden and similar soils: 5 percent of the unit
Whitecow and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

201F—Windham, very stony-Rock outcrop-Lap, very stony, complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Windham and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.5 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Lap and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 70 percent

Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Warneke and similar soils: 6 percent of the unit
Maiden and similar soils: 5 percent of the unit
Whitecow and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

202D—Windham-Judell complex, 8 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Windham and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Judell and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 8 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from limestone
Fine-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.6 inches

Additional Components

Lap and similar soils: 3 percent of the unit
Maiden and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit
Watne and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

202E—Windham-Judell complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Windham and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.9 inches

Judell and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained

Parent material:
Fine-loamy colluvium derived from limestone
Fine-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.6 inches

Additional Components

Lap and similar soils: 4 percent of the unit
Maiden and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

203D—Windham gravelly loam, 4 to 15 percent slopes, stony

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Windham, stony, and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Additional Components

Judell and similar soils: 4 percent of the unit
Maiden and similar soils: 4 percent of the unit
Lap and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit
Windham soils that are not stony: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

203E—Windham gravelly loam, 15 to 35 percent slopes, stony

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Windham, stony, and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Additional Components

Judell and similar soils: 4 percent of the unit
Maiden and similar soils: 4 percent of the unit
Windham soils that are not stony: 3 percent of the unit
Lap and similar soils: 2 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

204D—Windham-Maiden-Lap complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Windham and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges

Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.1 inches

Maiden and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.9 inches

Lap and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Judell and similar soils: 2 percent of the unit
Warneke and similar soils: 2 percent of the unit
Rock outcrop: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

204E—Windham, stony-Maiden, very stony-Lap, very stony, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Windham and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.1 inches

Maiden and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.7 inches

Lap and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Rock outcrop: 6 percent of the unit
Judell and similar soils: 5 percent of the unit
Warneke and similar soils: 5 percent of the unit
Whitecow and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

204F—Windham, very stony-Maiden, very stony-Rock outcrop complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Windham and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.5 inches

Maiden and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.7 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Lap and similar soils: 4 percent of the unit
Warneke and similar soils: 3 percent of the unit
Whitecow and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

205E—Windham very cobbly loam, 4 to 35 percent slopes, very stony

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Windham and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 4 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.5 inches

Additional Components

Judell and similar soils: 3 percent of the unit
Lap and similar soils: 3 percent of the unit
Maiden and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit
Whitecow and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

205F—Windham very cobbly loam, 35 to 60 percent slopes, very stony

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Windham and similar soils

Extent: 80 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.5 inches

Additional Components

Lap and similar soils: 4 percent of the unit
Rock outcrop: 4 percent of the unit
Judell and similar soils: 3 percent of the unit
Maiden and similar soils: 3 percent of the unit
Warneke and similar soils: 3 percent of the unit
Whitecow and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

206F—Windham-Windham, stony, complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Windham and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.1 inches

Windham, stony, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Gravelly loam

Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.1 inches

Additional Components

Whitecow and similar soils: 6 percent of the unit
Warneke and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

207E—Windham, stony-Lap, very stony-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Windham and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.1 inches

Lap and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Judell and similar soils: 3 percent of the unit
Maiden and similar soils: 3 percent of the unit
Warneke and similar soils: 2 percent of the unit
Whitecow and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

207F—Windham, stony-Lap, very stony-Rock outcrop complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Windham and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained

Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.1 inches

Lap and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Maiden and similar soils: 5 percent of the unit
Judell and similar soils: 4 percent of the unit
Warneke and similar soils: 3 percent of the unit
Whitecow and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

208D—Windham-Judell gravelly loams, 8 to 25 percent slopes, stony

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Windham, stony, and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 25 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Judell and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from limestone
Fine-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.4 inches

Additional Components

Maiden and similar soils: 6 percent of the unit
Lap and similar soils: 5 percent of the unit
Rock outcrop: 5 percent of the unit
Windham soils that are not stony: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

211A—Clunton silty clay loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, foothills, mountains, valleys
Elevation: 3,800 to 6,500 feet

Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Clunton and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Silty clay loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.9 inches

Additional Components

Clunton loam and similar soils: 5 percent of the unit
Cometcrik and similar soils: 4 percent of the unit
Dougcliff and similar soils: 3 percent of the unit
Meadowcreek and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

221A—Zatony clay loam, 0 to 2 percent slopes, wet

Map Unit Setting

Landscape: Valleys, river valleys, uplands
Elevation: 3,800 to 5,400 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Zatony and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, drainageways, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Saline and sodic, clayey alluvium derived from shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Water table: Within a depth of 60 inches
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 4.4 inches

Additional Components

Trudau and similar soils: 4 percent of the unit
Ethridge and similar soils: 3 percent of the unit
Ledger and similar soils: 3 percent of the unit
Moltoner and similar soils: 3 percent of the unit
Mckenton and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

231A—Ledger-Moltoner-Mckenton complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,400 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Ledger and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Silty clay loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Saline and sodic, clayey alluvium derived from shale-siltstone
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 6.4 inches

Moltoner and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Poorly drained
Parent material: Saline and sodic, fine-loamy, stratified recent alluvium
Native plant cover type: Rangeland

Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 6.6 inches

Mckenton and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Saline and sodic, clayey recent alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 6.3 inches

Additional Components

Wetsand and similar soils: 4 percent of the unit
Cardwell and similar soils: 3 percent of the unit
Riverrun and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

232A—Clunton-Wetsand-Bonebasin complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 90 to 115 days

Component Description

Clunton and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Silty clay loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.9 inches

Wetsand and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Poorly drained
Parent material: Loamy alluvium over sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Occasional
Water table: Within a depth of 60 inches
Available water capacity: Mainly 3.6 inches

Bonebasin and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Drainageways, flood plains
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Organic material over fine-loamy alluvium and sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.6 inches

Additional Components

Meadowcreek and similar soils: 3 percent of the unit
Riverrun and similar soils: 3 percent of the unit
Cardwell and similar soils: 2 percent of the unit
Handke and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

233A—Ledger-Wetsand, saline, complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,400 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Ledger and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Saline and sodic, clayey alluvium derived from shale-siltstone
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 6.5 inches

Wetsand and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Poorly drained
Parent material: Loamy alluvium over sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Salinity: Saline within a depth of 30 inches
Available water capacity: Mainly 3.2 inches

Additional Components

Moltoner and similar soils: 5 percent of the unit
Cardwell and similar soils: 4 percent of the unit
Mckenton and similar soils: 4 percent of the unit
Riverrun and similar soils: 4 percent of the unit
Ryell and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

241E—Whitlash, very stony-Rock outcrop-Perma, stony, complex, 2 to 25 percent slopes

Map Unit Setting

Landscape: Uplands, foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Whitlash and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 2 to 25 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Perma and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.4 inches

Additional Components

Brickner and similar soils: 6 percent of the unit

Sawicki and similar soils: 5 percent of the unit
Mocmont and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

241F—Whitlash, very stony-Rock outcrop-Perma, very stony, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Whitlash and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Perma and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.4 inches

Additional Components

Sawicki and similar soils: 4 percent of the unit
Brickner and similar soils: 3 percent of the unit
Kadygulch and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

245E—Tolbert, very stony-Rock outcrop-Absarook, stony, complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,200 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Tolbert and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 1.0 inch

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Absarook and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from sandstone
Residuum derived from basalt
Fine-loamy slope alluvium over residuum derived from basalt
Residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.0 inches

Additional Components

Blaincreek and similar soils: 7 percent of the unit
Sawicki and similar soils: 5 percent of the unit
Brickner and similar soils: 4 percent of the unit
Work and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

251B—Cozberg sandy loam, 1 to 4 percent slopes, stony

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Cozberg and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 1 to 4 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Coarse-loamy alluvium over sandy and gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.2 inches

Additional Components

Bronec and similar soils: 2 percent of the unit
Anamac and similar soils: 1 percent of the unit
Brocko and similar soils: 1 percent of the unit
Sixbeacon and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

251D—Cozberg sandy loam, 4 to 15 percent slopes, stony

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Cozberg and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 4 to 15 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Coarse-loamy alluvium over sandy and gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.2 inches

Additional Components

Anamac and similar soils: 5 percent of the unit
Bronec and similar soils: 4 percent of the unit

Brocko and similar soils: 3 percent of the unit
Rencot and similar soils: 2 percent of the unit
Varney and similar soils: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

261D—Crago-Brocko complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Brocko and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-silty, calcareous alluvium
Coarse-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 11.8 inches

Additional Components

Amesha and similar soils: 6 percent of the unit
Pensore and similar soils: 4 percent of the unit
Musselshell and similar soils: 3 percent of the unit
Cozberg and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

261E—Crago-Brocko complex, 15 to 60 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 25 to 60 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Brocko and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-silty, calcareous alluvium
Coarse-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 11.8 inches

Additional Components

Bronec and similar soils: 4 percent of the unit

Musselshell and similar soils: 4 percent of the unit
Pensore and similar soils: 4 percent of the unit
Walbert and similar soils: 4 percent of the unit
Amesha and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit
Shoddy and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

263D—Crago-Rock outcrop-Pensore complex, 4 to 25 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly alluvium derived from limestone
- Calcareous, gravelly colluvium derived from limestone
- Calcareous, gravelly slope alluvium derived from limestone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Pensore and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, knolls, ridges, strath terraces
Slope: 4 to 25 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Additional Components

Roto and similar soils: 8 percent of the unit
Crago soils that have slopes of more than 15 percent: 7 percent of the unit
Kalsted and similar soils: 3 percent of the unit
Amesha and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

263F—Crago, stony-Rock outcrop-Pensore, stony, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago, stony, and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly alluvium derived from limestone
- Calcareous, gravelly colluvium derived from limestone
- Calcareous, gravelly slope alluvium derived from limestone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Pensore and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, knolls, ridges, strath terraces
Slope: 25 to 60 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Additional Components

Crago soils that are not stony: 5 percent of the unit
Roto and similar soils: 4 percent of the unit
Kalsted and similar soils: 3 percent of the unit
Amesha and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

264C—Crago-Amesha complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Amesha and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.0 inches

Additional Components

Crago, stony, and similar soils: 6 percent of the unit
Kalsted and similar soils: 5 percent of the unit
Amesha, cobbly, and similar soils: 3 percent of the unit
Cozberg and similar soils: 3 percent of the unit
Sixbeacon and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

264D—Crago-Amesha complex, 8 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 8 to 15 percent

Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Amesha and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 8 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.0 inches

Additional Components

Crago, stony, and similar soils: 5 percent of the unit
Kalsted and similar soils: 4 percent of the unit
Roto and similar soils: 3 percent of the unit
Sixbeacon and similar soils: 2 percent of the unit
Amesha, gravelly, and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

264E—Crago-Amesha complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Amesha and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 15 to 35 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.0 inches

Additional Components

Crago, stony, and similar soils: 5 percent of the unit
Amesha soils that have slopes of less than 15 percent: 4 percent of the unit
Kalsted and similar soils: 3 percent of the unit
Roto and similar soils: 2 percent of the unit
Sixbeacon and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

264F—Crago-Amesha complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 35 to 60 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly alluvium derived from limestone
- Calcareous, gravelly colluvium derived from limestone
- Calcareous, gravelly slope alluvium derived from limestone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Amesha and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 35 to 60 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, coarse-loamy Tertiary valley fill alluvium
- Calcareous, gravelly colluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.0 inches

Additional Components

Crago, very stony, and similar soils: 7 percent of the unit
Amesha, cobbly, and similar soils: 6 percent of the unit
Sixbeacon and similar soils: 3 percent of the unit
Pensore and similar soils: 2 percent of the unit
Rock outcrop: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

265B—Crago gravelly loam, 1 to 4 percent slopes, stony

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 1 to 4 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly alluvium derived from limestone
- Calcareous, gravelly colluvium derived from limestone
- Calcareous, gravelly slope alluvium derived from limestone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Additional Components

Amesha and similar soils: 4 percent of the unit
Brocko and similar soils: 2 percent of the unit
Bronec and similar soils: 2 percent of the unit
Musselshell and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

265D—Crago gravelly loam, 4 to 15 percent slopes, stony

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam

Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Calcareous, gravelly alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Additional Components

Amesha and similar soils: 3 percent of the unit
Crago, very stony, and similar soils: 3 percent of the unit
Musselshell and similar soils: 2 percent of the unit
Sixbeacon and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

265E—Crago very cobbly loam, 15 to 45 percent slopes, very stony

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Additional Components

Amesha and similar soils: 5 percent of the unit
Bronec and similar soils: 4 percent of the unit
Brocko and similar soils: 2 percent of the unit
Kalsted and similar soils: 2 percent of the unit
Musselshell and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

266D—Crago, stony-Crago complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago, stony, and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 4 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Crago and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted

Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Additional Components

Amesha and similar soils: 6 percent of the unit
Musselshell and similar soils: 5 percent of the unit
Cozberg and similar soils: 4 percent of the unit
Pensore and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

266E—Crago, stony-Crago complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago, stony, and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Crago and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Additional Components

Amesha and similar soils: 3 percent of the unit
Cozberg and similar soils: 3 percent of the unit
Musselshell and similar soils: 3 percent of the unit
Pensore and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

267F—Crago, very stony-Pensore, stony-Rock outcrop complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained

Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Pensore and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, knolls, ridges, strath terraces
Slope: 25 to 60 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Amesha and similar soils: 6 percent of the unit
Brocko and similar soils: 5 percent of the unit
Bronec and similar soils: 5 percent of the unit
Sixbeacon and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

268C—Crago-Amesha cobbly loams, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 2 to 8 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.4 inches

Amesha and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Crago, stony, and similar soils: 5 percent of the unit
Amesha soils that have slopes of more than 8 percent: 4 percent of the unit
Musselshell and similar soils: 4 percent of the unit
Sixbeacon and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

269D—Crago, very stony, and Crago, rubbly, soils, 2 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet

Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Crago, very stony, and similar soils

Extent: 65 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 2 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly alluvium derived from limestone
- Calcareous, gravelly colluvium derived from limestone
- Calcareous, gravelly slope alluvium derived from limestone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Crago, rubbly, and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 2 to 15 percent
Surface layer texture: Stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly alluvium derived from limestone
- Calcareous, gravelly colluvium derived from limestone
- Calcareous, gravelly slope alluvium derived from limestone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.0 inches

Additional Components

Sieben and similar soils: 5 percent of the unit
Sixbeacon and similar soils: 3 percent of the unit
Vendome and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

271C—Bronec-Amesha complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Bronec and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Sandy and gravelly, calcareous alluvium
- Sandy and gravelly, calcareous slope alluvium
- Sandy and gravelly, calcareous Tertiary valley fill alluvium
- Sandy and gravelly colluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.3 inches

Amesha and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, coarse-loamy Tertiary valley fill alluvium
- Calcareous, gravelly colluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.0 inches

Additional Components

Bronec, very stony, and similar soils: 5 percent of the unit
Sappington and similar soils: 4 percent of the unit
Kalsted and similar soils: 3 percent of the unit
Geohrock and similar soils: 2 percent of the unit
Redfist and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

271D—Bronec-Amesha complex, 8 to 15 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 8 to 15 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.0 inches

Amesha and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Amesha soils that have slopes of more than 15 percent: 5 percent of the unit
Bronec, stony, and similar soils: 5 percent of the unit
Geohrock and similar soils: 5 percent of the unit
Sappington and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

271E—Bronec-Amesha complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 15 to 35 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.0 inches

Amesha and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Bronec, very cobbly, and similar soils

Extent: 20 percent of the map unit

Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Additional Components

Bronec, very stony, and similar soils: 5 percent of the unit
Amesha soils that have slopes of more than 35 percent: 4 percent of the unit
Sappington and similar soils: 3 percent of the unit
Geohrock and similar soils: 2 percent of the unit
Cabbart and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

271F—Bronec-Amesha-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Amesha and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 35 to 60 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists of outcroppings and exposures of Tertiary fill material on ridges and escarpments. Tertiary fill material consists of unconsolidated, stratified sediments.

Additional Components

Bronec, very stony, and similar soils: 5 percent of the unit
Geohrock and similar soils: 3 percent of the unit
Sieben and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

272E—Bronec-Geohrock-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam

Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.8 inches

Geohrock and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 15 to 45 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly Tertiary valley fill alluvium
Gravelly slope alluvium
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.6 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists of outcroppings and exposures of Tertiary fill material on ridges and escarpments. Tertiary fill material consists of unconsolidated, stratified sediments.

Additional Components

Bronec soils that have slopes of more than 45 percent: 5 percent of the unit
Amesha and similar soils: 4 percent of the unit
Cabbart and similar soils: 4 percent of the unit
Sieben and similar soils: 4 percent of the unit
Sappington and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

273D—Bronec-Shoddy-Amesha complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.3 inches

Shoddy and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Hills, knolls, ridges
Slope: 4 to 15 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Calcareous, clayey residuum derived from semiconsolidated shale-siltstone
Calcareous, clayey slope alluvium over residuum derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Amesha and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 4 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.0 inches

Additional Components

Brocko and similar soils: 3 percent of the unit
Cabbart and similar soils: 2 percent of the unit
Kobarter and similar soils: 2 percent of the unit
Walbert and similar soils: 2 percent of the unit
Udecide and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

273E—Bronec-Shoddy-Amesha complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.3 inches

Shoddy and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hills, knolls, ridges
Slope: 15 to 35 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Calcareous, clayey residuum derived from semiconsolidated shale-siltstone
Calcareous, clayey slope alluvium over residuum derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Amesha and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 15 to 35 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.0 inches

Additional Components

Brocko and similar soils: 5 percent of the unit
Cabbart and similar soils: 4 percent of the unit
Walbert and similar soils: 4 percent of the unit
Kobarter and similar soils: 3 percent of the unit
Udecide and similar soils: 2 percent of the unit
Varney and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

274A—Bronec complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors

Slope: 0 to 2 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Sandy and gravelly, calcareous alluvium
- Sandy and gravelly, calcareous slope alluvium
- Sandy and gravelly, calcareous Tertiary valley fill alluvium
- Sandy and gravelly colluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Bronec, very cobbly, and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 0 to 2 percent
Surface layer texture: Very cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Sandy and gravelly, calcareous alluvium
- Sandy and gravelly, calcareous slope alluvium
- Sandy and gravelly, calcareous Tertiary valley fill alluvium
- Sandy and gravelly colluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Additional Components

Bronec, stony, and similar soils: 6 percent of the unit
Geohrock and similar soils: 5 percent of the unit
Sieben and similar soils: 4 percent of the unit
Sappington and similar soils: 3 percent of the unit
Amesha and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

274C—Bronec complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 2 to 8 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Sandy and gravelly, calcareous alluvium
- Sandy and gravelly, calcareous slope alluvium
- Sandy and gravelly, calcareous Tertiary valley fill alluvium
- Sandy and gravelly colluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Bronec, very cobbly, and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 2 to 8 percent
Surface layer texture: Very cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Sandy and gravelly, calcareous alluvium
- Sandy and gravelly, calcareous slope alluvium
- Sandy and gravelly, calcareous Tertiary valley fill alluvium
- Sandy and gravelly colluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Additional Components

Bronec, very stony, and similar soils: 7 percent of the unit
Amesha and similar soils: 6 percent of the unit
Sappington and similar soils: 4 percent of the unit
Geohrock and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

274D—Bronec complex, 8 to 15 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 8 to 15 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Bronec, very cobbly, and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 8 to 15 percent
Surface layer texture: Very cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Additional Components

Amesha and similar soils: 5 percent of the unit
Bronec, very stony, and similar soils: 5 percent of the unit
Rencot and similar soils: 4 percent of the unit
Geohrock and similar soils: 3 percent of the unit
Sixbeacon and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

274E—Bronec-Bronec, very stony, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Bronec, very cobbly, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Bronec, very stony, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Amesha and similar soils: 5 percent of the unit
Geohrock and similar soils: 3 percent of the unit
Sixbeacon and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

275A—Bronec gravelly loam, 1 to 4 percent slopes, stony

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 1 to 4 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.0 inches

Additional Components

Amesha and similar soils: 3 percent of the unit
Bronec, very stony, and similar soils: 3 percent of the unit
Bronec, very cobbly, and similar soils: 2 percent of the unit
Geohrock and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

275D—Bronec very gravelly loam, 4 to 15 percent slopes, very stony

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 4 to 15 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Amesha and similar soils: 3 percent of the unit

Bronec soils that have slopes of more than 15 percent: 3 percent of the unit
Geohrock and similar soils: 2 percent of the unit
Sieben and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

275E—Bronec very gravelly loam, 15 to 35 percent slopes, very stony

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Bronec soils that have slopes of more than 35 percent: 5 percent of the unit
Amesha and similar soils: 4 percent of the unit
Geohrock and similar soils: 4 percent of the unit
Sieben and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

276C—Bronec gravelly loam, 2 to 8 percent slopes, saline

Map Unit Setting

Landscape: Valleys, uplands, river valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 4.0 inches

Additional Components

Bronec, cobbly, and similar soils: 6 percent of the unit
Trudau and similar soils: 5 percent of the unit
Amesha and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

277C—Bronec-Amesha cobbly loams, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 50 percent of the map unit

Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 2 to 8 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.0 inches

Amesha and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Bronec, very stony, and similar soils: 5 percent of the unit
Amesha soils that have slopes of more than 8 percent: 4 percent of the unit
Sappington and similar soils: 4 percent of the unit
Geohrock and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

278E—Bronec-Rencot-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Rencot and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary and metamorphic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Bronec, very stony, and similar soils: 3 percent of the unit
Sixbeacon and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

291C—Sieben complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sieben gravelly sandy loam and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Gravelly sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Sieben sandy loam and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Additional Components

Chinook and similar soils: 5 percent of the unit
Cozberg and similar soils: 5 percent of the unit
Geohrock and similar soils: 5 percent of the unit
Varney and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

292C—Sieben-Varney cobbly loams, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sieben and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.8 inches

Varney and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 2 to 8 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine grained and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.8 inches

Additional Components

Amesha and similar soils: 5 percent of the unit
Geohrock and similar soils: 5 percent of the unit
Sieben, stony, and similar soils: 5 percent of the unit
Varney soils that have slopes of more than 8 percent: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

293D—Sieben cobbly loam, 4 to 15 percent slopes, stony

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet

Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sieben and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.8 inches

Additional Components

Sieben, very stony, and similar soils: 3 percent of the unit
Bronec and similar soils: 2 percent of the unit
Udecide and similar soils: 2 percent of the unit
Varney and similar soils: 2 percent of the unit
Geohrock and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

294C—Sieben, stony-Sieberell, very stony, complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sieben and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 15 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.8 inches

Sieberell and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly slope alluvium over sandy and gravelly slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Additional Components

Sieben, very stony, and similar soils: 4 percent of the unit
Beaverell and similar soils: 3 percent of the unit
Sieben, bouldery, and similar soils: 3 percent of the unit
Bronec and similar soils: 2 percent of the unit
Varney and similar soils: 2 percent of the unit
Geohrock and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

295D—Sieben cobbly loam, 4 to 15 percent slopes, bouldery

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sieben and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained

Parent material: Calcareous, gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.8 inches

Additional Components

Sieben, very stony, and similar soils: 4 percent of the unit
Bronec and similar soils: 3 percent of the unit
Geohrock and similar soils: 3 percent of the unit
Amesha and similar soils: 2 percent of the unit
Udecide and similar soils: 2 percent of the unit
Varney and similar soils: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

296D—Sieberell-Sieben-Beaverell complex, 4 to 15 percent slopes, stony

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sieberell and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly slope alluvium over sandy and gravelly slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Sieben and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.8 inches

Beaverell and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, plains
Slope: 4 to 15 percent
Surface layer texture: Very cobbly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.8 inches

Additional Components

Geohrock and similar soils: 4 percent of the unit
Amesha and similar soils: 3 percent of the unit
Bronec and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

297D—Sieben, very stony-Sieben, rubbly, complex, 2 to 25 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sieben, very stony, and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 25 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly Tertiary valley fill alluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Sieben, rubbly, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 25 percent
Surface layer texture: Stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.9 inches

Additional Components

Bronec and similar soils: 8 percent of the unit
Rencot and similar soils: 7 percent of the unit
Rock outcrop: 3 percent of the unit
Rubble land: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

297F—Sieben, rubbly-Sieben, very stony, complex, 15 to 60 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sieben, rubbly, and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 60 percent
Surface layer texture: Stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.9 inches

Sieben, very stony, and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Additional Components

Bronec and similar soils: 4 percent of the unit
Rencot and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit
Rubble land: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

311D—Beenom, stony-Wimper-Whitlash, very stony, complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,200 to 6,200 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Beenom and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from hard, coarse grained sandstone
Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 2.0 inches

Wimper and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly colluvium derived from basalt
- Calcareous, gravelly colluvium derived from fine grained sandstone
- Calcareous, gravelly slope alluvium derived from basalt
- Calcareous, gravelly slope alluvium derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Whitlash and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Very channery coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly residuum derived from basalt
- Gravelly residuum derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.1 inches

Additional Components

Absarook and similar soils: 5 percent of the unit
Rock outcrop: 4 percent of the unit
Perma and similar soils: 3 percent of the unit
Zbart and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

311F—Beenom, stony-Wimper-Whitlash, very stony, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,200 to 6,200 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Beenom and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from hard, coarse grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.0 inches

Wimper and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly colluvium derived from basalt
- Calcareous, gravelly colluvium derived from fine grained sandstone
- Calcareous, gravelly slope alluvium derived from basalt
- Calcareous, gravelly slope alluvium derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Whitlash and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 15 to 35 percent

Surface layer texture: Very channery coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.1 inches

Additional Components

Absarook and similar soils: 6 percent of the unit
Perma and similar soils: 5 percent of the unit
Rock outcrop: 5 percent of the unit
Zbart and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

321A—Fairway-Meadowcreek complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, river valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Fairway and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 10.6 inches

Meadowcreek and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.5 inches

Additional Components

Faith and similar soils: 5 percent of the unit
Riverrun and similar soils: 4 percent of the unit
Clunton and similar soils: 3 percent of the unit
Handke and similar soils: 2 percent of the unit
Wetsand and similar soils: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

322A—Fairway loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, river valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 90 to 115 days

Component Description

Fairway and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 10.6 inches

Additional Components

Clunton and similar soils: 3 percent of the unit
Meadowcreek and similar soils: 3 percent of the unit

Cardwell and similar soils: 2 percent of the unit
Riverrun and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

323A—Fairway-Mckenton silt loams, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, river valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Fairway and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 10.6 inches

Mckenton and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Saline and sodic, clayey recent alluvium
Native plant cover type: Rangeland
Frequency of flooding: Occasional
Water table: Within a depth of 60 inches
Ponding duration: Brief
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 6.4 inches

Additional Components

Meadowcreek and similar soils: 4 percent of the unit
Clunton and similar soils: 3 percent of the unit
Ledger and similar soils: 3 percent of the unit
Riverrun and similar soils: 3 percent of the unit
Faith and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

324A—Fairway clay loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, river valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Fairway and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 10.2 inches

Additional Components

Meadowcreek and similar soils: 3 percent of the unit
Clunton and similar soils: 2 percent of the unit
Ledger and similar soils: 2 percent of the unit
Riverrun and similar soils: 2 percent of the unit
Faith and similar soils: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

325A—Fairway-Nestley clay loams, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, river valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Fairway and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 10.2 inches

Nestley and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Loamy alluvium over sandy and gravelly alluvium derived from fine grained igneous, sandstone, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 3.8 inches

Additional Components

Meadowcreek and similar soils: 3 percent of the unit
Pieriver and similar soils: 3 percent of the unit
Cardwell and similar soils: 2 percent of the unit
Riverrun and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

326A—Fairway-Moltoner complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, river valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Fairway and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 10.2 inches

Moltoner and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Silty clay loam
Restrictive feature: None noted
Drainage class: Poorly drained
Parent material: Saline and sodic, fine-loamy, stratified recent alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 6.6 inches

Additional Components

Faith and similar soils: 5 percent of the unit
Nestley and similar soils: 4 percent of the unit
Ledger and similar soils: 3 percent of the unit
Mckenton and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

327A—Faith loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Faith and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, drainageways, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 10.1 inches

Additional Components

Cardwell and similar soils: 3 percent of the unit
Clunton and similar soils: 3 percent of the unit
Fairway and similar soils: 2 percent of the unit
Meadowcreek and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

328A—Faith loam, 0 to 2 percent slopes, cool

Map Unit Setting

Landscape: River valleys, valleys, uplands, foothills
Elevation: 3,800 to 6,000 feet
Mean annual precipitation: 10 to 19 inches
Frost-free period: 80 to 115 days

Component Description

Faith and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, drainageways, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 10.1 inches

Additional Components

Clunton and similar soils: 4 percent of the unit
Farnuf and similar soils: 3 percent of the unit
Martinsdale and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

329C—Faith-Slickens complex, 0 to 8 percent slopes, impacted

Map Unit Setting

Landscape: River valleys, valleys, uplands, foothills
Elevation: 3,800 to 6,000 feet
Mean annual precipitation: 10 to 19 inches
Frost-free period: 80 to 115 days

Component Description

Faith and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, drainageways, flood-plain steps, terraces
Slope: 0 to 8 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 8.3 inches

Slickens

Extent: 35 percent of the map unit
Definition: Slickens are accumulations of fine textured material, such as material seperated in placer-mine and ore-mill operations. Slickens from ore mills commonly consist of freshly ground rock that has undergone chemical treatment during the milling process.

Additional Components

Breeton and similar soils: 5 percent of the unit
Pieriver and similar soils: 5 percent of the unit
Wetsand and similar soils: 5 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

331C—Geohrock-Bronec gravelly loams, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Geohrock and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly Tertiary valley fill alluvium
Gravelly slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Bronec and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.3 inches

Additional Components

Geohrock, stony, and similar soils: 5 percent of the unit
Bronec, very stony, and similar soils: 4 percent of the unit
Sappington and similar soils: 3 percent of the unit
Amesha and similar soils: 2 percent of the unit
Sieben and similar soils: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

331D—Geohrock-Bronec gravelly loams, 8 to 15 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Geohrock and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly Tertiary valley fill alluvium
Gravelly slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Bronec and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.3 inches

Additional Components

Geohrock, stony, and similar soils: 5 percent of the unit
Bronec, stony, and similar soils: 4 percent of the unit
Amesha and similar soils: 3 percent of the unit
Sappington and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

332D—Geohrock-Sappington complex, 4 to 15 percent slopes, stony

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Geohrock and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly Tertiary valley fill alluvium
Gravelly slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Sappington and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 4 to 15 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Additional Components

Bronec and similar soils: 5 percent of the unit
Amesha and similar soils: 4 percent of the unit
Rencot and similar soils: 3 percent of the unit
Sieben and similar soils: 2 percent of the unit
Varney and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

334D—Geohrock, stony-Bronec, very stony, complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Geohrock and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 4 to 15 percent
Surface layer texture: Cobbly clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly Tertiary valley fill alluvium
Gravelly slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Bronec and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 4 to 15 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Geohrock soils that have slopes of more than 15 percent: 5 percent of the unit
Bronec soils that have slopes of more than 15 percent: 4 percent of the unit
Amesha and similar soils: 3 percent of the unit
Sappington and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

341A—Pieriver-Cardwell-Riverrun loams, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Pieriver and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy recent alluvium derived from mixed rock sources
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.5 inches

Cardwell and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-silty alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.8 inches

Riverrun and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 2.5 inches

Additional Components

Nestley and similar soils: 4 percent of the unit
Wetsand and similar soils: 4 percent of the unit
Meadowcreek and similar soils: 3 percent of the unit
Bonebasin and similar soils: 2 percent of the unit
Mckenton and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

342A—Handke fine sandy loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,400 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Handke and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Fine sandy loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Sandy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare

Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.5 inches

Additional Components

Cardwell and similar soils: 2 percent of the unit
Ledger and similar soils: 2 percent of the unit
Pieriver and similar soils: 2 percent of the unit
Riverrun and similar soils: 2 percent of the unit
Ryell and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

361D—Udecide-Varney-Walbert complex, 4 to 25 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Udecide and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Hillsides, interfluves, knolls
Slope: 4 to 15 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy residuum derived from semiconsolidated sandstone-siltstone
Calcareous, fine-loamy slope alluvium over residuum derived from semiconsolidated sandstone-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Varney and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 4 to 15 percent
Surface layer texture: Sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine grained and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.0 inches

Walbert and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Hillsides, interfluves, ridges
Slope: 4 to 25 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Parent material: Sandy residuum derived from semiconsolidated, coarse grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Additional Components

Delpoint and similar soils: 3 percent of the unit
Ethridge and similar soils: 3 percent of the unit
Shoddy and similar soils: 3 percent of the unit
Anamac and similar soils: 2 percent of the unit
Brocko and similar soils: 2 percent of the unit
Cabbart and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

362C—Udecide-Varney sandy clay loams, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Udecide and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Hillsides, interfluves, knolls
Slope: 2 to 8 percent

Surface layer texture: Sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy residuum derived from semiconsolidated sandstone-siltstone
Calcareous, fine-loamy slope alluvium over residuum derived from semiconsolidated sandstone-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Varney and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 2 to 8 percent
Surface layer texture: Sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine grained and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.0 inches

Additional Components

Udecide soils that have slopes of more than 8 percent: 6 percent of the unit
Varney soils that have slopes of more than 8 percent: 5 percent of the unit
Sappington and similar soils: 4 percent of the unit
Delpoint and similar soils: 3 percent of the unit
Amesha and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

371A—Havre-Ryell-Handke complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Havre and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.6 inches

Ryell and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Coarse-loamy over sandy and gravelly recent alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.7 inches

Handke and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Fine sandy loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Sandy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.5 inches

Additional Components

Riverrun and similar soils: 3 percent of the unit
Faith and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

372A—Havre loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Havre and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.6 inches

Additional Components

Handke and similar soils: 3 percent of the unit
Ryell and similar soils: 3 percent of the unit
Riverrun and similar soils: 2 percent of the unit
Trudau and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

381C—Kalsted gravelly sandy loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Kalsted and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges, terraces
Slope: 2 to 8 percent
Surface layer texture: Gravelly sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, coarse-loamy alluvium
Calcareous, coarse-loamy colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Additional Components

Amesha and similar soils: 3 percent of the unit
Chinook and similar soils: 3 percent of the unit
Cozberg and similar soils: 2 percent of the unit
Kalsted, stony, and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

382D—Kalsted gravelly sandy loam, 4 to 15 percent slopes, stony

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Kalsted, stony, and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges, terraces
Slope: 4 to 15 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, coarse-loamy alluvium
Calcareous, coarse-loamy colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.3 inches

Additional Components

Bronec and similar soils: 3 percent of the unit
Cozberg and similar soils: 3 percent of the unit
Kalsted soils that are not stony: 3 percent of the unit

Amesha and similar soils: 2 percent of the unit
Crago and similar soils: 2 percent of the unit
Roto and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

391C—Musselshell-Crago gravelly loams, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Musselshell and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, plains
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium derived from limestone
Coarse-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.6 inches

Crago and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Additional Components

Pensore and similar soils: 3 percent of the unit
Roto and similar soils: 3 percent of the unit
Amesha and similar soils: 2 percent of the unit
Rock outcrop: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

394B—Musselshell-Crago cobbly loams, 1 to 4 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Musselshell and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, plains
Slope: 1 to 4 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium derived from limestone
Coarse-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.4 inches

Crago and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 1 to 4 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.4 inches

Additional Components

Amesha and similar soils: 4 percent of the unit
Bronec and similar soils: 4 percent of the unit
Roto and similar soils: 4 percent of the unit
Sieben and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

401A—Moltoner silty clay loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,400 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 90 to 115 days

Component Description

Moltoner and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Silty clay loam
Restrictive feature: None noted
Drainage class: Poorly drained
Parent material: Saline and sodic, fine-loamy, stratified recent alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 6.6 inches

Additional Components

Ledger and similar soils: 5 percent of the unit
Clunton and similar soils: 4 percent of the unit
Cardwell and similar soils: 3 percent of the unit
Wetsand and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

411A—Nestley loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 90 to 115 days

Component Description

Nestley and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Loamy alluvium over sandy and gravelly alluvium derived from fine grained igneous, sandstone, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 3.8 inches

Additional Components

Cardwell and similar soils: 3 percent of the unit
Riverrun and similar soils: 3 percent of the unit
Clunton and similar soils: 2 percent of the unit
Meadowcreek and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

413A—Nestley-Riverrun-Pieriver complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,400 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 90 to 115 days

Component Description

Nestley and similar soils

Extent: 30 percent of the map unit

Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Loamy alluvium over sandy and gravelly alluvium derived from fine grained igneous, sandstone, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 3.8 inches

Riverrun and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Gravelly sandy loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 2.1 inches

Pieriver and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy recent alluvium derived from mixed rock sources
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.1 inches

Additional Components

Mckenton and similar soils: 5 percent of the unit
Clunton and similar soils: 4 percent of the unit
Handke and similar soils: 3 percent of the unit
Ledger and similar soils: 3 percent of the unit
Ryell and similar soils: 3 percent of the unit
Moltoner and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

421E—Perma, stony-Whitlash, very stony, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Perma and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.1 inches

Whitlash and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Devilfence and similar soils: 4 percent of the unit
Whitlash, gravelly, and similar soils: 4 percent of the unit
Wilspring and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

421F—Perma-Whitlash complex, 35 to 60 percent slopes, very stony

Map Unit Setting

Landscape: Uplands, foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Perma and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.4 inches

Whitlash and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Connieo and similar soils: 4 percent of the unit
Whitlash, gravelly, and similar soils: 4 percent of the unit
Baxton and similar soils: 3 percent of the unit
Breeton and similar soils: 2 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

422F—Perma, very stony-Whitlash, very stony-Rock outcrop complex, 15 to 45 percent slopes, moist

Map Unit Setting

Landscape: Uplands, foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Perma and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.4 inches

Whitlash and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary, metamorphic, and fine grained volcanic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Connieo and similar soils: 5 percent of the unit
Baxton and similar soils: 4 percent of the unit
Breeton and similar soils: 3 percent of the unit
Perma, stony, and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

423C—Wimper loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Wimper and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly colluvium derived from basalt
Calcareous, gravelly colluvium derived from fine grained sandstone
Calcareous, gravelly slope alluvium derived from basalt
Calcareous, gravelly slope alluvium derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.6 inches

Additional Components

Clasoil and similar soils: 3 percent of the unit
Shawmut and similar soils: 3 percent of the unit
Farnuf and similar soils: 2 percent of the unit
Quaint and similar soils: 1 percent of the unit
Windham and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

423D—Wimper loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Wimper and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 8 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly colluvium derived from basalt
Calcareous, gravelly colluvium derived from fine grained sandstone
Calcareous, gravelly slope alluvium derived from basalt
Calcareous, gravelly slope alluvium derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.6 inches

Additional Components

Clasoil and similar soils: 3 percent of the unit
Shawmut and similar soils: 3 percent of the unit
Martinsdale and similar soils: 2 percent of the unit
Windham and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

423E—Wimper loam, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Wimper and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly colluvium derived from basalt
- Calcareous, gravelly colluvium derived from fine grained sandstone
- Calcareous, gravelly slope alluvium derived from basalt
- Calcareous, gravelly slope alluvium derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.6 inches

Additional Components

Maiden and similar soils: 3 percent of the unit
Windham and similar soils: 3 percent of the unit
Farnuf and similar soils: 2 percent of the unit
Martinsdale and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

424D—Wimper-Wimper, stony, complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Wimper and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly colluvium derived from basalt
- Calcareous, gravelly colluvium derived from fine grained sandstone
- Calcareous, gravelly slope alluvium derived from basalt
- Calcareous, gravelly slope alluvium derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.6 inches

Wimper, stony, and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly colluvium derived from basalt
- Calcareous, gravelly colluvium derived from fine grained sandstone
- Calcareous, gravelly slope alluvium derived from basalt
- Calcareous, gravelly slope alluvium derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Additional Components

Whitlash and similar soils: 3 percent of the unit
Farnuf and similar soils: 2 percent of the unit

Maiden and similar soils: 2 percent of the unit
Windham and similar soils: 2 percent of the unit
Rock outcrop: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

424E—Wimper-Wimper, stony, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Wimper and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly colluvium derived from basalt
- Calcareous, gravelly colluvium derived from fine grained sandstone
- Calcareous, gravelly slope alluvium derived from basalt
- Calcareous, gravelly slope alluvium derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.6 inches

Wimper, stony, and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly colluvium derived from basalt
- Calcareous, gravelly colluvium derived from fine grained sandstone
- Calcareous, gravelly slope alluvium derived from basalt
- Calcareous, gravelly slope alluvium derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Additional Components

Whitlash and similar soils: 4 percent of the unit
Farnuf and similar soils: 3 percent of the unit
Maiden and similar soils: 3 percent of the unit
Windham and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

425E—Wimper gravelly loam, 8 to 35 percent slopes, stony

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Wimper, stony, and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 8 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly colluvium derived from basalt
- Calcareous, gravelly colluvium derived from fine grained sandstone
- Calcareous, gravelly slope alluvium derived from basalt
- Calcareous, gravelly slope alluvium derived from fine grained sandstone

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.4 inches

Additional Components

Maiden and similar soils: 3 percent of the unit

Wimper soils that are not stony: 3 percent of the unit
Farnuf and similar soils: 2 percent of the unit
Windham and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

426F—Wimper-Whitlash association, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Wimper and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 35 to 60 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly colluvium derived from basalt
Calcareous, gravelly colluvium derived from fine grained sandstone
Calcareous, gravelly slope alluvium derived from basalt
Calcareous, gravelly slope alluvium derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Whitlash and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Perma and similar soils: 4 percent of the unit
Windham and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit
Rubble land: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

427E—Perma-Whitlash complex, 15 to 35 percent slopes, bouldery

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Perma and similar soils

Extent: 70 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.4 inches

Whitlash and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)

Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Whitlash, very stony, and similar soils: 6 percent of the unit
Perma, very bouldery, and similar soils: 5 percent of the unit
Rock outcrop: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

429E—Perma, very stony-Perma, rubbly-Rock outcrop complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Perma, very stony, and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.4 inches

Perma, rubbly, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary and metamorphic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Castner and similar soils: 6 percent of the unit
Hilger and similar soils: 4 percent of the unit
Hilger, rubbly, and similar soils: 3 percent of the unit
Perma soils that have slopes of more than 35 percent: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

441F—Warneke-Warneke, very stony-Rock outcrop association, 8 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Warneke and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges

Slope: 8 to 60 percent
Surface layer texture: Extremely gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from limestone
Gravelly slope alluvium derived from limestone over residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.7 inch

Warneke, very stony, and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 60 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from limestone
Gravelly slope alluvium derived from limestone over residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.8 inch

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Maiden, warm, and similar soils: 5 percent of the unit
Lap and similar soils: 4 percent of the unit
Whitecow and similar soils: 4 percent of the unit
Windham and similar soils: 4 percent of the unit
Maiden and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

451A—Geohrock cobbly clay loam, 1 to 4 percent slopes, stony

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Geohrock and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 1 to 4 percent
Surface layer texture: Cobbly clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly Tertiary valley fill alluvium
Gravelly slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Additional Components

Bronec and similar soils: 3 percent of the unit
Sappington and similar soils: 3 percent of the unit
Bronec, stony, and similar soils: 2 percent of the unit
Sieben and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

461D—Absarook-Beenom complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,200 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Absarook and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Hillsides, ridges

Slope: 2 to 15 percent
Surface layer texture: Loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from sandstone
Residuum derived from basalt
Fine-loamy slope alluvium over residuum derived from basalt
Residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.0 inches

Beenom and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from hard, coarse grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.0 inches

Additional Components

Absarook, stony, and similar soils: 7 percent of the unit
Sawicki and similar soils: 6 percent of the unit
Blaincreek and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

471A—Cardwell-Pieriver complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 90 to 115 days

Component Description

Cardwell and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Silty clay loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-silty alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 6.0 inches

Pieriver and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy recent alluvium derived from mixed rock sources
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.5 inches

Additional Components

Riverrun and similar soils: 6 percent of the unit
Meadowcreek and similar soils: 5 percent of the unit
Clunton and similar soils: 4 percent of the unit
Absay and similar soils: 3 percent of the unit
Trudau and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

481A—Riverrun gravelly sandy loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Riverrun and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Gravelly sandy loam

Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Occasional
Water table: Within a depth of 60 inches
Available water capacity: Mainly 2.1 inches

Additional Components

Ryell and similar soils: 5 percent of the unit
Handke and similar soils: 4 percent of the unit
Meadowcreek and similar soils: 3 percent of the unit
Wetsand and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

482A—Riverrun-Cardwell complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 90 to 115 days

Component Description

Riverrun and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 2.5 inches

Cardwell and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Silty clay loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-silty alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 6.0 inches

Additional Components

Pieriver and similar soils: 4 percent of the unit
Clunton and similar soils: 2 percent of the unit
Handke and similar soils: 2 percent of the unit
Nestley and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

483A—Riverrun, Handke, and Ryell soils, 0 to 2 percent slopes, channeled

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Riverrun and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Gravelly sandy loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Frequent
Water table: Within a depth of 60 inches
Available water capacity: Mainly 2.1 inches

Handke and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained

Parent material: Sandy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Frequent
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.5 inches

Ryell and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Coarse-loamy over sandy and gravelly recent alluvium
Native plant cover type: Rangeland
Frequency of flooding: Frequent
Available water capacity: Mainly 5.6 inches

Additional Components

Clunton and similar soils: 2 percent of the unit
Meadowcreek and similar soils: 2 percent of the unit
Nestley and similar soils: 2 percent of the unit
Riverwash: 2 percent of the unit
Wetsand and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

492D—Roto-Pensore-Crago complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Roto and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly slope alluvium over residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.6 inches

Pensore and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, knolls, ridges, strath terraces
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Crago and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 4 to 15 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Additional Components

Roto soils that have slopes of more than 15 percent: 5 percent of the unit
Crago, stony, and similar soils: 4 percent of the unit
Amesha and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

492E—Roto-Pensore-Crago complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, valleys

Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Roto and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very channery loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly slope alluvium over residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.5 inches

Pensore and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, knolls, ridges, strath terraces
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Crago and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly alluvium derived from limestone
- Calcareous, gravelly colluvium derived from limestone
- Calcareous, gravelly slope alluvium derived from limestone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Additional Components

Roto, stony, and similar soils: 5 percent of the unit
Amesha and similar soils: 4 percent of the unit
Crago, stony, and similar soils: 4 percent of the unit
Haxby and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

492F—Roto-Pensore-Crago complex, 35 to 60 percent slopes, stony

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Roto and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very channery loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly slope alluvium over residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.4 inches

Pensore and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, knolls, ridges, strath terraces
Slope: 35 to 60 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Crago and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, gravelly alluvium derived from limestone
- Calcareous, gravelly colluvium derived from limestone
- Calcareous, gravelly slope alluvium derived from limestone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Additional Components

Roto soils that have slopes of less than 35 percent: 5 percent of the unit
Crago soils that have slopes of less than 35 percent: 4 percent of the unit
Amesha and similar soils: 3 percent of the unit
Geohrock and similar soils: 2 percent of the unit
Rock outcrop: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

493D—Pensore-Rock outcrop-Roto complex, 2 to 25 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Pensore and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, knolls, ridges, strath terraces
Slope: 2 to 25 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Roto and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly slope alluvium over residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.6 inches

Additional Components

Crago and similar soils: 5 percent of the unit
Musselshell and similar soils: 4 percent of the unit
Amesha and similar soils: 3 percent of the unit
Brocko and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

511C—Haxby-Amesha-Rencot complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Haxby and similar soils

Extent: 40 percent of the map unit

Geomorphic position: Hillsides, ridges, strath terraces
Slope: 4 to 15 percent
Surface layer texture: Loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Coarse-loamy colluvium over gravelly residuum derived from basalt
- Coarse-loamy colluvium over gravelly residuum derived from fine grained sandstone
- Coarse-loamy slope alluvium over gravelly residuum derived from basalt
- Coarse-loamy slope alluvium over gravelly residuum derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.4 inches

Amesha and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 4 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, coarse-loamy Tertiary valley fill alluvium
- Calcareous, gravelly colluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.0 inches

Rencot and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly residuum derived from basalt
- Gravelly residuum derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.5 inches

Additional Components

Haxby soils that have slopes of more than 15 percent: 3 percent of the unit
Anamac and similar soils: 2 percent of the unit
Bronec and similar soils: 2 percent of the unit
Rencot soils that have slopes of more than 15 percent: 2 percent of the unit
Rock outcrop: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

521A—Cardwell-Riverrun complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Cardwell and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-silty alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.8 inches

Riverrun and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Gravelly sandy loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Rare

Water table: Within a depth of 60 inches
Available water capacity: Mainly 2.1 inches

Additional Components

Havre and similar soils: 6 percent of the unit
Faith and similar soils: 5 percent of the unit
Nestley and similar soils: 3 percent of the unit
Pieriver and similar soils: 3 percent of the unit
Wetsand and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

522A—Ryell-Riverrun complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, river valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Ryell and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Coarse-loamy over sandy and gravelly recent alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.7 inches

Riverrun and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Very gravelly fine sandy loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 2.1 inches

Additional Components

Havre and similar soils: 6 percent of the unit
Pieriver and similar soils: 6 percent of the unit
Cardwell and similar soils: 5 percent of the unit
Wetsand and similar soils: 5 percent of the unit
Clunton and similar soils: 4 percent of the unit
Nestley and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

523A—Cardwell-Riverrun-Pieriver complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Cardwell and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-silty alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Occasional
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.6 inches

Riverrun and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Gravelly sandy loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Occasional

Water table: Within a depth of 60 inches
Available water capacity: Mainly 2.1 inches

Pieriver and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy recent alluvium derived from mixed rock sources
Native plant cover type: Rangeland
Frequency of flooding: Occasional
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.5 inches

Additional Components

Wetsand and similar soils: 8 percent of the unit
Handke and similar soils: 7 percent of the unit
Clunton and similar soils: 5 percent of the unit
Moltoner and similar soils: 3 percent of the unit
Nestley and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

524A—Cardwell loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Cardwell and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-silty alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.8 inches

Additional Components

Pieriver and similar soils: 4 percent of the unit
Clunton and similar soils: 3 percent of the unit
Meadowcreek and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

525A—Cardwell-Riverrun complex, 0 to 2 percent slopes, saline

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,400 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Cardwell and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-silty alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Salinity: Saline within a depth of 30 inches
Available water capacity: Mainly 4.3 inches

Riverrun and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Gravelly sandy loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Salinity: Saline within a depth of 30 inches
Available water capacity: Mainly 2.0 inches

Additional Components

Trudau and similar soils: 5 percent of the unit
Wetsand and similar soils: 5 percent of the unit
Ledger and similar soils: 3 percent of the unit
Handke and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

531C—Sappington very cobbly clay loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sappington and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Very cobbly clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.9 inches

Additional Components

Amesha and similar soils: 2 percent of the unit
Bronec and similar soils: 2 percent of the unit
Geohrock and similar soils: 2 percent of the unit
Sappington, cobbly, and similar soils: 2 percent of the unit
Varney and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

532C—Sappington-Amesha complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sappington and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.0 inches

Amesha and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.0 inches

Additional Components

Sappington soils that have slopes of more than 8 percent: 4 percent of the unit
Amesha, cobbly, and similar soils: 3 percent of the unit
Brocko and similar soils: 3 percent of the unit
Varney and similar soils: 3 percent of the unit
Floweree and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

533A—Sappington clay loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet

Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sappington and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 0 to 2 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.0 inches

Additional Components

Amesha and similar soils: 3 percent of the unit
Sappington soils that have slopes of more than 2 percent: 3 percent of the unit
Geohrock and similar soils: 2 percent of the unit
Varney and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

533C—Sappington clay loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sappington and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.0 inches

Additional Components

Amesha and similar soils: 3 percent of the unit
Sappington soils that have slopes of more than 8 percent: 3 percent of the unit
Geohrock and similar soils: 2 percent of the unit
Varney and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

533D—Sappington clay loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sappington and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 8 to 15 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.0 inches

Additional Components

Amesha and similar soils: 5 percent of the unit
Geohrock and similar soils: 4 percent of the unit
Raghorn and similar soils: 3 percent of the unit
Varney and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

534C—Sappington-Geohrock complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet

Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sappington and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Gravelly clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.9 inches

Geohrock and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 2 to 8 percent
Surface layer texture: Cobbly clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly Tertiary valley fill alluvium
Gravelly slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Additional Components

Amesha and similar soils: 4 percent of the unit
Bronec and similar soils: 4 percent of the unit
Geohrock, stony, and similar soils: 4 percent of the unit
Sappington soils that have slopes of more than 8 percent: 4 percent of the unit
Varney and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

534D—Sappington-Geohrock complex, 8 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sappington and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 8 to 15 percent
Surface layer texture: Gravelly clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.9 inches

Geohrock and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 8 to 15 percent
Surface layer texture: Cobbly clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly Tertiary valley fill alluvium
Gravelly slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Additional Components

Geohrock, stony, and similar soils: 5 percent of the unit
Sappington soils that have slopes of less than 8 percent: 5 percent of the unit
Varney and similar soils: 5 percent of the unit
Amesha and similar soils: 4 percent of the unit
Bronec and similar soils: 4 percent of the unit
Udecide and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

536A—Sappington-Amesha complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sappington and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 0 to 2 percent
Surface layer texture: Gravelly clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.9 inches

Amesha and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 0 to 2 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Rothiemay and similar soils: 5 percent of the unit
Varney and similar soils: 4 percent of the unit
Bronec and similar soils: 2 percent of the unit
Geohrock and similar soils: 2 percent of the unit
Haxby and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

537B—Sappington loam, 1 to 4 percent slopes, stony

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sappington and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 1 to 4 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Additional Components

Sappington soils that have slopes of more than 4 percent: 4 percent of the unit
Amesha and similar soils: 2 percent of the unit
Bronec and similar soils: 2 percent of the unit
Geohrock and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

537D—Sappington loam, 4 to 15 percent slopes, stony

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sappington and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 4 to 15 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Additional Components

Amesha and similar soils: 5 percent of the unit
Bronec and similar soils: 4 percent of the unit
Geohrock and similar soils: 3 percent of the unit
Varney and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

538C—Sappington gravelly loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sappington and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.0 inches

Additional Components

Amesha and similar soils: 3 percent of the unit
Bronec and similar soils: 3 percent of the unit
Chinook and similar soils: 2 percent of the unit
Geohrock and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

539B—Sappington-Amesha complex, 2 to 8 percent slopes, cobbly

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sappington and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Cobbly clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.9 inches

Amesha and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Amesha soils that have slopes of more than 8 percent: 4 percent of the unit
Sappington, very cobbly, and similar soils: 4 percent of the unit
Bronec and similar soils: 3 percent of the unit
Varney and similar soils: 3 percent of the unit
Geohrock and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

539C—Sappington-Amesha complex, 2 to 8 percent slopes, stony

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sappington and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Amesha and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.3 inches

Additional Components

Sappington soils that have slopes of more than 8 percent: 6 percent of the unit
Amesha soils that have slopes of more than 8 percent: 4 percent of the unit
Bronec and similar soils: 4 percent of the unit
Geohrock and similar soils: 3 percent of the unit
Varney and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

541D—Whitlash, very stony-Brickner, stony-Rock outcrop complex, 4 to 25 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Whitlash and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 4 to 25 percent
Surface layer texture: Very channery coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Brickner and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 25 percent
Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained

Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary and metamorphic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Beenom and similar soils: 5 percent of the unit
Wickes and similar soils: 4 percent of the unit
Perma and similar soils: 3 percent of the unit
Wimper and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

541E—Whitlash, very stony-Brickner, stony-Rock outcrop complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Whitlash and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Very channery coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.8 inch

Brickner and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary and metamorphic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Beenom and similar soils: 6 percent of the unit
Perma and similar soils: 5 percent of the unit
Shawmut and similar soils: 3 percent of the unit
Wickes and similar soils: 3 percent of the unit
Wimper and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

551E—Brickner, stony-Whitlash, very stony-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Brickner and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges

Slope: 25 to 60 percent
Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Whitlash and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Very channery coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.8 inch

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary and metamorphic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Wickes and similar soils: 6 percent of the unit
Shawmut and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

552F—Brickner, very bouldery-Rock outcrop-Tolbert, very bouldery, association, 25 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Brickner and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Tolbert and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Forest land

Flooding: None
Available water capacity: Mainly 1.0 inch

Additional Components

Mocmont and similar soils: 6 percent of the unit
Blaincreek and similar soils: 5 percent of the unit
Shawmut and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

553F—Brickner, very stony-Wickes, very bouldery-Rock outcrop complex, 15 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Brickner and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Wickes and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt over residuum derived from basalt
Gravelly colluvium over residuum derived from sandstone
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.0 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Rubble land: 15 percent of the unit
Mocmont and similar soils: 5 percent of the unit
Shawmut and similar soils: 4 percent of the unit
Blaincreek and similar soils: 3 percent of the unit
Perma and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

554F—Brickner, very stony-Rock outcrop-Mocmont, stony, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Brickner and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Mocmont and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from basalt
- Gravelly colluvium derived from fine grained sandstone
- Gravelly slope alluvium derived from basalt
- Gravelly slope alluvium derived from argillaceous limestone
- Gravelly slope alluvium derived from fine grained sandstone

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.1 inches

Additional Components

Rubble land: 15 percent of the unit
Tolbert and similar soils: 7 percent of the unit
Blaincreek and similar soils: 6 percent of the unit
Roegulch and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

562C—Trudau-Bronec, saline, complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: River valleys, valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Trudau and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, flood-plain steps, knolls, stream terraces, terraces
Slope: 2 to 8 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Saline and sodic, fine-loamy alluvium derived from shale
Native plant cover type: Rangeland
Flooding: None
Salinity: Saline within a depth of 30 inches
Available water capacity: Mainly 5.8 inches

Bronec, saline, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Sandy and gravelly, calcareous alluvium
- Sandy and gravelly, calcareous slope alluvium
- Sandy and gravelly, calcareous Tertiary valley fill alluvium
- Sandy and gravelly colluvium

Native plant cover type: Rangeland
Flooding: None
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 4.0 inches

Additional Components

Bronec soils that are not saline: 6 percent of the unit
Amesha and similar soils: 5 percent of the unit
Sappington and similar soils: 5 percent of the unit
Geohrock and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

564C—Trudau-Benz clay loams, 2 to 8 percent slopes

Map Unit Setting

Landscape: River valleys, valleys, uplands

Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Trudau and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, flood-plain steps, knolls, stream terraces, terraces
Slope: 2 to 8 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Saline and sodic, fine-loamy alluvium derived from shale
Native plant cover type: Rangeland
Flooding: None
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 5.9 inches

Benz and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans
Slope: 2 to 8 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Saline and sodic, fine-loamy alluvium derived from shale
Native plant cover type: Rangeland
Flooding: None
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 6.8 inches

Additional Components

Kobarter and similar soils: 3 percent of the unit
Varney and similar soils: 3 percent of the unit
Abor and similar soils: 2 percent of the unit
Absay and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

581E—Whitecow, stony-Warneke, very stony-Rock outcrop complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Whitecow and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 6.1 inches

Warneke and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from limestone
Gravelly slope alluvium derived from limestone over residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.8 inch

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Maiden and similar soils: 4 percent of the unit
Lap and similar soils: 3 percent of the unit
Shawmut and similar soils: 3 percent of the unit

Management

• For information about managing this map unit,

see the appropriate sections in Part II of this publication.

581F—Whitecow, very stony-Warneke, very stony-Rock outcrop complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Whitecow and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.9 inches

Warneke and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from limestone
Gravelly slope alluvium derived from limestone over residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.8 inch

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Lap and similar soils: 4 percent of the unit
Perma and similar soils: 3 percent of the unit
Shawmut and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

582E—Whitecow, bouldery-Shawmut, very bouldery-Rock outcrop complex, 15 to 45 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Whitecow and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Very channery loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 6.0 inches

Shawmut and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained

Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.2 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Warneke and similar soils: 6 percent of the unit
Whitecow soils that are not bouldery: 5 percent of the unit
Wimper and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

583E—Whitecow-Warneke complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Whitecow and similar soils

Extent: 65 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Channery loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.9 inches

Warneke and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from limestone
Gravelly slope alluvium derived from limestone over residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.8 inch

Additional Components

Rock outcrop: 5 percent of the unit
Whitecow, stony, and similar soils: 3 percent of the unit
Wimper and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

584F—Whitecow-Whitecow, stony-Warneke complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Whitecow and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Channery loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.9 inches

Whitecow, stony, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges

Slope: 25 to 60 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 6.0 inches

Warneke and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from limestone
Gravelly slope alluvium derived from limestone over residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.8 inch

Additional Components

Whitecow, gravelly, and similar soils: 6 percent of the unit
Windham and similar soils: 5 percent of the unit
Rock outcrop: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

585E—Whitecow, bouldery-Shawmut, very bouldery-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Whitecow and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Very channery loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 6.0 inches

Shawmut and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.1 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Warneke and similar soils: 6 percent of the unit
Whitecow, very gravelly, and similar soils: 5 percent of the unit
Windham and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

591F—Windham-Rock outcrop-Warneke complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Windham and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.9 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Warneke and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Extremely gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from limestone
Gravelly slope alluvium derived from limestone over residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.7 inch

Additional Components

Whitecow and similar soils: 6 percent of the unit
Lap and similar soils: 5 percent of the unit
Maiden and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

631D—Rencot-Rock outcrop-Rencot, stony, complex, 8 to 25 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Rencot and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 8 to 25 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.5 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary, metamorphic, and fine grained volcanic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Rencot, stony, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 8 to 25 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt

Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Additional Components

Bronec and similar soils: 4 percent of the unit
Geohrock and similar soils: 3 percent of the unit
Lahood and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

631E—Rencot-Rencot, very stony-Rock outcrop complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Rencot and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 25 to 60 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Rencot, very stony, and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary, metamorphic, and fine grained volcanic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Bronec and similar soils: 5 percent of the unit
Geohrock and similar soils: 3 percent of the unit
Lahood and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

631F—Rencot-Bronec-Rock outcrop complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Rencot and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 35 to 70 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Bronec and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 35 to 70 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.8 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary, metamorphic, and fine grained volcanic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Bronec soils that have slopes of less than 35 percent: 3 percent of the unit
Roto and similar soils: 3 percent of the unit
Amesha and similar soils: 2 percent of the unit
Geohrock and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

632C—Rencot-Lahood-Rock outcrop complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Rencot and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 2 to 8 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Lahood and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from basalt
Gravelly colluvium over residuum derived from fine grained sandstone
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Gravelly slope alluvium over residuum derived from basalt
Gravelly slope alluvium over residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.7 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary, metamorphic, and fine grained volcanic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Amesha and similar soils: 2 percent of the unit
Brocko and similar soils: 2 percent of the unit
Bronec and similar soils: 2 percent of the unit
Haxby and similar soils: 2 percent of the unit
Sieben and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

632D—Rencot-Lahood-Rock outcrop complex, 8 to 25 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Rencot and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 8 to 25 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Lahood and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from basalt
Gravelly colluvium over residuum derived from fine grained sandstone
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Gravelly slope alluvium over residuum derived from basalt
Gravelly slope alluvium over residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.7 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary, metamorphic, and fine grained volcanic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Anamac and similar soils: 2 percent of the unit
Haxby and similar soils: 2 percent of the unit
Lahood, stony, and similar soils: 2 percent of the unit
Rencot, very stony, and similar soils: 2 percent of the unit
Sixbeacon and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

632E—Rencot, very stony-Lahood, stony-Rock outcrop complex, 25 to 45 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Rencot and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 25 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 1.4 inches

Lahood and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 25 to 45 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly colluvium over residuum derived from basalt
- Gravelly colluvium over residuum derived from fine grained sandstone
- Gravelly residuum derived from basalt
- Gravelly residuum derived from fine grained sandstone
- Gravelly slope alluvium over residuum derived from basalt
- Gravelly slope alluvium over residuum derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.7 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary, metamorphic, and fine grained volcanic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Rencot soils that have slopes of more than 45 percent: 5 percent of the unit
Roto and similar soils: 4 percent of the unit
Bronec and similar soils: 3 percent of the unit
Varney and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

633D—Rencot, very stony-Bronec, very stony-Rock outcrop complex, 4 to 25 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Rencot and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 4 to 25 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly residuum derived from basalt
- Gravelly residuum derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Bronec and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 4 to 15 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Sandy and gravelly, calcareous alluvium
- Sandy and gravelly, calcareous slope alluvium
- Sandy and gravelly, calcareous Tertiary valley fill alluvium
- Sandy and gravelly colluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Additional Components

Lahood and similar soils: 7 percent of the unit
Sieben and similar soils: 6 percent of the unit
Sixbeacon and similar soils: 5 percent of the unit
Haxby and similar soils: 3 percent of the unit
Amesha and similar soils: 2 percent of the unit
Geohrock and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

634E—Rencot, very stony-Rock outcrop-Bronec, very stony, complex, 25 to 45 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Rencot and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 25 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Bronec and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 25 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly, calcareous alluvium
Sandy and gravelly, calcareous slope alluvium
Sandy and gravelly, calcareous Tertiary valley fill alluvium
Sandy and gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Geohrock and similar soils: 6 percent of the unit
Bronec, stony, and similar soils: 5 percent of the unit
Cabbart and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

641C—Varney gravelly loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Varney and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted

Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine grained and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.7 inches

Additional Components

Udecide and similar soils: 3 percent of the unit
Varney sandy clay loam and similar soils: 3 percent of the unit
Anamac and similar soils: 2 percent of the unit
Geohrock and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

642C—Varney clay loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Varney and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 2 to 8 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine grained and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.1 inches

Additional Components

Raghorn and similar soils: 3 percent of the unit
Varney soils that have slopes of more than 8 percent: 3 percent of the unit
Sappington and similar soils: 2 percent of the unit
Sieben and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

642D—Varney clay loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Varney and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 8 to 15 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine grained and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.1 inches

Additional Components

Anamac and similar soils: 5 percent
Udecide and similar soils: 4 percent
Abor and similar soils: 3 percent
Ethridge and similar soils: 3 percent

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

643A—Varney cobbly loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Varney and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 0 to 2 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine grained and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.8 inches

Additional Components

Varney, stony, and similar soils: 4 percent of the unit
Sappington and similar soils: 3 percent of the unit
Sieben and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

643C—Varney cobbly loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Varney and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 2 to 8 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine grained and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.8 inches

Additional Components

Raghorn and similar soils: 2 percent of the unit
Sappington and similar soils: 2 percent of the unit
Sieben and similar soils: 2 percent of the unit
Udecide and similar soils: 2 percent of the unit
Varney, stony, and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

644C—Varney complex, 2 to 15 percent slopes, gullied

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Varney clay loam and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 2 to 15 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine grained and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.1 inches

Varney loam and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 2 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained

Parent material:
Fine-loamy slope alluvium derived from fine grained and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.2 inches

Varney, gravelly, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 2 to 15 percent
Surface layer texture: Gravelly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine grained and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.8 inches

Additional Components

Sieben and similar soils: 4 percent of the unit
Cozberg and similar soils: 3 percent of the unit
Raghorn and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

645B—Varney-Sieben complex, 1 to 4 percent slopes, stony

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Varney and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 1 to 4 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine grained and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.0 inches

Sieben and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 1 to 4 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.8 inches

Additional Components

Udecide and similar soils: 5 percent of the unit
Ethridge and similar soils: 4 percent of the unit
Anamac and similar soils: 2 percent of the unit
Cozberg and similar soils: 2 percent of the unit
Sieben, very stony, and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

645D—Varney, stony-Sieben, very stony, complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Varney and similar soils

Extent: 60 percent of the map unit

Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 4 to 15 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine grained and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.0 inches

Sieben and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.8 inches

Additional Components

Geohrock and similar soils: 2 percent of the unit
Sappington and similar soils: 2 percent of the unit
Sieben soils that have slopes of more than 15 percent: 2 percent of the unit
Udecide and similar soils: 2 percent of the unit
Varney soils that have slopes of more than 15 percent: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

645E—Varney, stony-Sieben, very stony, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Varney and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 15 to 35 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine grained and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.0 inches

Sieben and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.8 inches

Additional Components

Amesha and similar soils: 5 percent of the unit
Bronec and similar soils: 4 percent of the unit
Varney soils that have slopes of less than 15 percent: 3 percent of the unit
Sieben soils that have slopes of less than 15 percent: 2 percent of the unit
Lahood and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

646C—Varney loam, 2 to 8 percent slopes, stony

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Varney and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, terraces
Slope: 2 to 8 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from fine grained and coarse grained igneous rocks
Fine-loamy slope alluvium derived from semiconsolidated sandstone, siltstone, and shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.0 inches

Additional Components

Geohrock and similar soils: 2 percent of the unit
Varney soils that have slopes of more than 8 percent: 2 percent of the unit
Sappington and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

651C—Judell gravelly loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Judell and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from limestone
Fine-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.3 inches

Additional Components

Windham and similar soils: 4 percent of the unit
Maiden and similar soils: 3 percent of the unit
Judell, cobbly, and similar soils: 2 percent of the unit
Lap and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

652C—Judell cobbly loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Judell and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from limestone
Fine-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.4 inches

Additional Components

Judell soils that have slopes of more than 8 percent: 4 percent of the unit
Martinsdale and similar soils: 3 percent of the unit
Windham and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

655C—Judell gravelly loam, 2 to 8 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Judell and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from limestone
Fine-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.3 inches

Additional Components

Judell soils that have slopes of more than 8 percent: 5 percent of the unit
Windham and similar soils: 3 percent of the unit
Maiden and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

662B—Judell gravelly loam, 1 to 4 percent slopes, very stony

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Judell and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 1 to 4 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from limestone
Fine-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.4 inches

Additional Components

Windham and similar soils: 4 percent of the unit
Judell loam and similar soils: 3 percent of the unit
Maiden and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

691A—Meadowcreek, Clunton, and Cardwell soils, 0 to 2 percent slopes, channeled

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Meadowcreek and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Occasional
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.5 inches

Clunton and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent

Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Frequent
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.7 inches

Cardwell and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Silty clay loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-silty alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Occasional
Water table: Within a depth of 60 inches
Available water capacity: Mainly 6.0 inches

Additional Components

Mckenton and similar soils: 6 percent of the unit
Bonebasin and similar soils: 5 percent of the unit
Wetsand and similar soils: 5 percent of the unit
Moltoner and similar soils: 3 percent of the unit
Riverrun and similar soils: 3 percent of the unit
Ryell and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

692A—Meadowcreek-Nestley-Riverrun complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 90 to 115 days

Component Description

Meadowcreek and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.5 inches

Nestley and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Loamy alluvium over sandy and gravelly alluvium derived from fine grained igneous, sandstone, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 3.8 inches

Riverrun and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Gravelly sandy loam
Restrictive feature: None noted
Drainage class: Moderately well drained
Parent material: Sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 2.1 inches

Additional Components

Mckenton and similar soils: 4 percent of the unit
Clunton and similar soils: 3 percent of the unit
Ryell and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

713E—Raghorn-Ethridge-Kalsted complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Raghorn and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Fine-loamy alluvium over sandy alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.1 inches

Ethridge and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Clayey alluvium derived from semiconsolidated, clayey shale
Clayey slope alluvium derived from semiconsolidated, clayey shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.5 inches

Kalsted and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges, terraces
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, coarse-loamy alluvium
Calcareous, coarse-loamy colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.9 inches

Additional Components

Bronec and similar soils: 4 percent of the unit
Amesha and similar soils: 3 percent of the unit
Ethridge soils that have slopes of less than 15 percent: 3 percent of the unit
Varney and similar soils: 3 percent of the unit
Cozberg and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

713F—Raghorn-Ethridge-Kalsted complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Raghorn and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls
Slope: 35 to 70 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Fine-loamy alluvium over sandy alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.1 inches

Ethridge and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, terraces
Slope: 35 to 70 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Clayey alluvium derived from semiconsolidated, clayey shale
Clayey slope alluvium derived from semiconsolidated, clayey shale

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.5 inches

Kalsted and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges, terraces
Slope: 35 to 60 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, coarse-loamy alluvium
Calcareous, coarse-loamy colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.9 inches

Additional Components

Bronec and similar soils: 5 percent of the unit
Amesha and similar soils: 4 percent of the unit
Cozberg and similar soils: 3 percent of the unit
Varney and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

721E—Zbart-Bondoe-Brocko complex, 4 to 25 percent slopes

Map Unit Setting

Landscape: Uplands, valleys, foothills
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Zbart and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 4 to 25 percent
Surface layer texture: Very channery loam
Depth to restrictive feature: 5 to 10 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Gravelly residuum derived from claystone
Gravelly residuum derived from hard, fractured shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.8 inch

Bondoe and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans
Slope: 4 to 15 percent
Surface layer texture: Channery loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium derived from calcareous shale
Gravelly colluvium derived from clayey shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.8 inches

Brocko and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-silty, calcareous alluvium
Coarse-silty, calcareous loess
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 11.8 inches

Additional Components

Rock outcrop: 4 percent of the unit
Beenom and similar soils: 3 percent of the unit
Benz and similar soils: 3 percent of the unit
Crago and similar soils: 3 percent of the unit
Whitlash and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

731C—Martinsdale, stony-Martinsdale-Hilger complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,200 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Martinsdale, stony, and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, fine-loamy alluvium derived from granite
- Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.0 inches

Martinsdale and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, fine-loamy alluvium derived from granite
- Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.0 inches

Hilger and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 2 to 8 percent
Surface layer texture: Very cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from basalt
- Gravelly colluvium derived from fine grained sandstone
- Gravelly slope alluvium derived from basalt
- Gravelly slope alluvium derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.2 inches

Additional Components

Shawmut and similar soils: 6 percent of the unit
Absarook and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

732D—Martinsdale-Shawmut, stony-Martinsdale, bouldery, complex, 4 to 25 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, valleys
Elevation: 4,200 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Martinsdale and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Cobbly clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, fine-loamy alluvium derived from granite
- Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.0 inches

Shawmut and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 4 to 25 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from basalt
- Gravelly slope alluvium derived from basalt

Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 4.6 inches

Martinsdale, bouldery, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 25 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Additional Components

Windham and similar soils: 6 percent of the unit
Judell and similar soils: 5 percent of the unit
Crago and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

734D—Martinsdale loam, 4 to 15 percent slopes, very stony

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Martinsdale and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Additional Components

Shawmut and similar soils: 5 percent of the unit
Martinsdale soils that do not have stones on the surface: 4 percent of the unit
Tolbert and similar soils: 3 percent of the unit
Work and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

735C—Martinsdale-Absarook-Whitlash complex, 2 to 8 percent slopes, stony

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,200 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Martinsdale and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Absarook and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 2 to 8 percent
Surface layer texture: Loam

Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from sandstone
Residuum derived from basalt
Fine-loamy slope alluvium over residuum derived from basalt
Residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.0 inches

Whitlash and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.6 inches

Additional Components

Tolbert and similar soils: 5 percent of the unit
Rock outcrop: 4 percent of the unit
Hilger and similar soils: 3 percent of the unit
Shawmut and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

736C—Martinsdale-Work complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Martinsdale and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Cobbly clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.0 inches

Work and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, clayey alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Calcareous, gravelly outwash till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Additional Components

Wilspring and similar soils: 4 percent of the unit
Quaint and similar soils: 3 percent of the unit
Windham and similar soils: 3 percent of the unit
Work, stony, and similar soils: 3 percent of the unit
Watne and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

742E—Shawmut, stony-Martinsdale, very stony, complex, 4 to 25 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Shawmut and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 15 to 25 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Martinsdale and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Additional Components

Hilger and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Shawmut, bouldery, and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

744E—Shawmut, bouldery-Shawmut, stony-Tolbert, bouldery, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Shawmut, bouldery, and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Shawmut, stony, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Tolbert and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Additional Components

Rock outcrop: 6 percent of the unit
Blaincreek and similar soils: 5 percent of the unit
Martinsdale and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

745D—Shawmut-Wickes-Gnojek complex, 2 to 15 percent slopes, bouldery

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Shawmut and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 2 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Wickes and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 2 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt over residuum derived from basalt
Gravelly colluvium over residuum derived from sandstone
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Gnojek and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.1 inches

Additional Components

Rock outcrop: 4 percent of the unit
Martinsdale and similar soils: 3 percent of the unit
Wickes, cobbly, and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

745E—Shawmut, bouldery-Shawmut, very bouldery-Tolbert, bouldery, complex, 15 to 45 percent slopes, dry

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Shawmut, bouldery, and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides

Slope: 15 to 45 percent
Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Shawmut, very bouldery, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 15 to 45 percent
Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Tolbert and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Additional Components

Rock outcrop: 6 percent of the unit
Martinsdale and similar soils: 5 percent of the unit
Blaincreek and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

746E—Shawmut-Tolbert complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Shawmut and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.0 inches

Tolbert and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 8 to 35 percent
Surface layer texture: Cobbly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Rock outcrop: 5 percent of the unit
Wickes and similar soils: 4 percent of the unit
Martinsdale and similar soils: 3 percent of the unit
Whitlash and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

747E—Shawmut, stony-Tolbert, very stony, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Shawmut and similar soils

Extent: 70 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Tolbert and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 15 to 35 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Wimper and similar soils: 5 percent of the unit
Martinsdale and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

748E—Shawmut, stony-Wickes, very stony, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Shawmut and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.7 inches

Wickes and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt over residuum derived from basalt
Gravelly colluvium over residuum derived from sandstone
Gravelly slope alluvium over residuum derived from basalt

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.0 inches

Additional Components

Gnojek and similar soils: 6 percent of the unit
Rock outcrop: 5 percent of the unit
Brickner and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

751C—Sixbeacon gravelly sandy loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sixbeacon and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 2 to 8 percent
Surface layer texture: Gravelly sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly alluvium over sandy and gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Additional Components

Cozberg and similar soils: 3 percent of the unit
Vendome and similar soils: 3 percent of the unit
Bronec and similar soils: 2 percent of the unit
Kalsted and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

752B—Sixbeacon-Vendome complex, 1 to 4 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sixbeacon and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 1 to 4 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly alluvium over sandy and gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Vendome and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, knolls, plains, terraces
Slope: 1 to 4 percent
Surface layer texture: Very cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly alluvium over sandy and gravelly alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Additional Components

Cozberg and similar soils: 5 percent of the unit
Bronec and similar soils: 4 percent of the unit
Chinook and similar soils: 3 percent of the unit
Sieben and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

753C—Sixbeacon-Cozberg complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sixbeacon and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 2 to 8 percent
Surface layer texture: Gravelly sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly alluvium over sandy and gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Cozberg and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 2 to 8 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Coarse-loamy alluvium over sandy and gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Bronec and similar soils: 6 percent of the unit
Anamac and similar soils: 5 percent of the unit
Vendome and similar soils: 5 percent of the unit
Sappington and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

754D—Sixbeacon-Cozberg, stony, complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Sixbeacon and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 4 to 15 percent
Surface layer texture: Cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly alluvium over sandy and gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Cozberg and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 4 to 15 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Coarse-loamy alluvium over sandy and gravelly Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.2 inches

Additional Components

Bronec and similar soils: 8 percent of the unit
Vendome and similar soils: 7 percent of the unit
Sieben and similar soils: 6 percent of the unit
Sieberell and similar soils: 4 percent of the unit
Chinook and similar soils: 3 percent of the unit
Amesha and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

755A—Vendome very cobbly loam, 0 to 4 percent slopes, very stony

Map Unit Setting

Landscape: Valley
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Vendome and similar soils

Extent: 95 percent of the map unit

Geomorphic position: Alluvial fans, knolls, plains, terraces
Slope: 0 to 4 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly alluvium over sandy and gravelly alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Additional Components

Sixbeacon and similar soils: 3 percent of the unit
Cozberg and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

773F—Rock outcrop-Pensore association, 15 to 60 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Rock outcrop

Extent: 45 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Pensore and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, knolls, ridges, strath terraces
Slope: 15 to 60 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Crago and similar soils: 5 percent of the unit
Roto and similar soils: 4 percent of the unit
Musselshell and similar soils: 3 percent of the unit
Pensore, stony, and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

774F—Rock outcrop-Whitlash, bouldery, association, 35 to 70 percent slopes

Map Unit Setting

Landscape: Uplands, foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Rock outcrop

Extent: 45 percent of the map unit
Definition: This component consists mainly of areas of exposed hard sedimentary, metamorphic, and fine grained volcanic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Whitlash and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Perma and similar soils: 8 percent of the unit
Mocmont and similar soils: 6 percent of the unit
Sawicki and similar soils: 6 percent of the unit
Blaincreek and similar soils: 5 percent of the unit
Brickner and similar soils: 5 percent of the unit
Wickes and similar soils: 5 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

775F—Rock outcrop-Lap-Lap, very stony, association, 15 to 70 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Rock outcrop

Extent: 45 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Lap and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 70 percent
Surface layer texture: Very gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Lap, very stony, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 70 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Maiden and similar soils: 4 percent of the unit
Castner and similar soils: 2 percent of the unit
Judell and similar soils: 2 percent of the unit
Windham and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

776D—Rock outcrop-Devilfence association, 2 to 25 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Rock outcrop

Extent: 45 percent of the map unit
Definition: This component consists mainly of areas of exposed hard, fractured shale bedrock. Flagstones litter the areas and accumulate at the base of hills and escarpments.

Devilfence and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 25 percent
Surface layer texture: Very channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Gravelly residuum derived from shale-siltstone
Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Wilspring and similar soils: 6 percent of the unit
Quincreek and similar soils: 5 percent of the unit
Vigilante and similar soils: 5 percent of the unit
Deville and similar soils: 3 percent of the unit
Quaint and similar soils: 3 percent of the unit
Wilde and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

777E—Rock outcrop-Clugulch-Bobowic complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Rock outcrop

Extent: 40 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Clugulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 4 to 10 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.7 inch

Bobowic and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Sandy and gravelly alluvium over residuum derived from granite
Sandy and gravelly colluvium over residuum derived from granite
Sandy and gravelly residuum derived from granite
Sandy and gravelly slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Additional Components

Tepecreek and similar soils: 5 percent of the unit
Caseypeak and similar soils: 4 percent of the unit
Hiore and similar soils: 3 percent of the unit
Peeler and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

777F—Rock outcrop-Clugulch-Bobowic complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 40 to 70 days

Component Description

Rock outcrop

Extent: 45 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Clugulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 4 to 10 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.7 inch

Bobowic and similar soils

Extent: 10 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 35 to 70 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Sandy and gravelly alluvium over residuum derived from granite
Sandy and gravelly colluvium over residuum derived from granite
Sandy and gravelly residuum derived from granite
Sandy and gravelly slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Additional Components

Tepecreek and similar soils: 5 percent of the unit
Caseypeak and similar soils: 4 percent of the unit
Hiore and similar soils: 3 percent of the unit
Peeler and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

778E—Rock outcrop-Kounter, very bouldery-Jeffcity, bouldery, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Rock outcrop

Extent: 50 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Kounter and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.8 inch

Jeffcity and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.4 inches

Additional Components

Cedric and similar soils: 4 percent of the unit
Baxton and similar soils: 2 percent of the unit
Catgulch and similar soils: 2 percent of the unit
Placerton and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

781A—Vendome sandy loam, 0 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Vendome and similar soils

Extent: 90 percent of the map unit

Geomorphic position: Alluvial fans, knolls, plains, terraces
Slope: 0 to 8 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly alluvium over sandy and gravelly alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Additional Components

Vendome and similar soils: 5 percent of the unit
Bronec and similar soils: 3 percent of the unit
Sixbeacon and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

782A—Vendome sandy loam, 0 to 8 percent slopes, stony

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Vendome, stony, and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, knolls, plains, terraces
Slope: 0 to 8 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly alluvium over sandy and gravelly alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Additional Components

Sixbeacon and similar soils: 4 percent of the unit
Bronec and similar soils: 3 percent of the unit
Vendome soils that are not stony: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

791C—Chinook sandy clay loam, 2 to 8 percent slopes, saline

Map Unit Setting

Landscape: Valleys, uplands, river valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Chinook, saline, and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, hills, terraces
Slope: 2 to 8 percent
Surface layer texture: Sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium
Coarse-loamy eolian deposits
Native plant cover type: Rangeland
Flooding: None
Salinity: Saline within a depth of 30 inches
Available water capacity: Mainly 4.8 inches

Additional Components

Chinook soils that are not saline: 2 percent of the unit
Trudau and similar soils: 2 percent of the unit
Amesha and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

811C—Ethridge, saline-Zatony clay loams, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands, river valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Ethridge, saline, and similar soils

Extent: 55 percent of the map unit

Geomorphic position: Alluvial fans, escarpments, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Clayey alluvium derived from semiconsolidated, clayey shale
Clayey slope alluvium derived from semiconsolidated, clayey shale
Native plant cover type: Rangeland
Flooding: None
Salinity: Saline within a depth of 30 inches
Available water capacity: Mainly 7.2 inches

Zatony and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, drainageways, flood-plain steps, terraces
Slope: 2 to 8 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Saline and sodic, clayey alluvium derived from shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Salinity: Saline within a depth of 30 inches
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 4.4 inches

Additional Components

Trudau and similar soils: 4 percent of the unit
Ethridge soils that are not saline: 3 percent of the unit
Kobarter and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

821C—Rothiemay loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Rothiemay and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, knolls, terraces
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, fine-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.2 inches

Additional Components

Amesha and similar soils: 4 percent of the unit
Bronec and similar soils: 3 percent of the unit
Sappington and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

831E—Shoddy-Cabbart-Kobarter complex, 4 to 25 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Shoddy and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Hills, knolls, ridges
Slope: 8 to 25 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Calcareous, clayey residuum derived from semiconsolidated shale-siltstone
Calcareous, clayey slope alluvium over residuum derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Cabbart and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hills, knolls
Slope: 8 to 25 percent
Surface layer texture: Loam

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from semiconsolidated siltstone
Loamy slope alluvium over residuum derived from calcareous siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Kobarter and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls
Slope: 4 to 15 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Clayey slope alluvium derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.2 inches

Additional Components

Amesha and similar soils: 5 percent of the unit
Brocko and similar soils: 4 percent of the unit
Bronec and similar soils: 3 percent of the unit
Walbert and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

832E—Shoddy-Rock outcrop-Delpoint complex, 2 to 25 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Shoddy and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Hills, knolls, ridges
Slope: 8 to 25 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Calcareous, clayey residuum derived from semiconsolidated shale-siltstone
Calcareous, clayey slope alluvium over residuum derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists of exposures of weakly consolidated sedimentary beds. These beds are primarily soft siltstone and sandstone. In places, harder layers of coarse grained sandstone cap the softer beds and form ledges. Cobble- and stone-sized fragments of sandstone accumulate at the base of escarpments and on fans at the base of hills.

Delpoint and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hills, knolls
Slope: 2 to 15 percent
Surface layer texture: Clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Fine-loamy alluvium over loamy residuum derived from semiconsolidated sandstone-siltstone
Fine-loamy residuum derived from semiconsolidated sandstone-siltstone
Fine-loamy slope alluvium over loamy residuum derived from semiconsolidated sandstone-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.8 inches

Additional Components

Abor and similar soils: 6 percent of the unit
Ethridge and similar soils: 5 percent of the unit
Cabbart and similar soils: 4 percent of the unit
Amesha and similar soils: 3 percent of the unit
Brocko and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

841A—Clunton loam, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, foothills, mountains, valleys
Elevation: 4,200 to 6,500 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Clunton and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Frequent
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.7 inches

Additional Components

Cometcrik and similar soils: 5 percent of the unit
Meadowcreek and similar soils: 4 percent of the unit
Dougcliff and similar soils: 3 percent of the unit
Riverrun and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

851D—Walbert-Shoddy-Cabbart complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Walbert and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Hillsides, interfluves, ridges
Slope: 2 to 15 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Parent material: Sandy residuum derived from semiconsolidated, coarse grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Shoddy and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hills, knolls, ridges
Slope: 2 to 15 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Calcareous, clayey residuum derived from semiconsolidated shale-siltstone
Calcareous, clayey slope alluvium over residuum derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Cabbart and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hills, knolls
Slope: 2 to 15 percent
Surface layer texture: Loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from semiconsolidated siltstone
Loamy slope alluvium over residuum derived from calcareous siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Additional Components

Udecide and similar soils: 5 percent of the unit
Varney and similar soils: 4 percent of the unit
Amesha and similar soils: 3 percent of the unit
Brocko and similar soils: 3 percent of the unit
Delpoint and similar soils: 3 percent of the unit
Bronec and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

851F—Walbert-Shoddy-Cabbart complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Walbert and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Hillsides, interfluves, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Parent material: Sandy residuum derived from semiconsolidated, coarse grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Shoddy and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hills, knolls, ridges
Slope: 15 to 35 percent
Surface layer texture: Silty clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Calcareous, clayey residuum derived from semiconsolidated shale-siltstone
Calcareous, clayey slope alluvium over residuum derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Cabbart and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hills, knolls
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from semiconsolidated siltstone
Loamy slope alluvium over residuum derived from calcareous siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.4 inches

Additional Components

Amesha and similar soils: 3 percent of the unit
Varney and similar soils: 3 percent of the unit
Bronec and similar soils: 2 percent of the unit
Sixbeacon and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

852C—Walbert sandy clay loam, 4 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Walbert and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Hillsides, interfluves, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Parent material: Sandy residuum derived from semiconsolidated, coarse grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Udecide and similar soils: 4 percent of the unit
Cabbart and similar soils: 3 percent of the unit
Varney and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

858E—Yetull-Yetull, stony, complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Yetull and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hills
Slope: 8 to 35 percent
Surface layer texture: Loamy fine sand
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Sandy eolian deposits
Sandy slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Yetull, stony, and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hills
Slope: 8 to 35 percent
Surface layer texture: Gravelly loamy fine sand
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Sandy eolian deposits
Sandy slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Additional Components

Bronec and similar soils: 5 percent of the unit
Chinook and similar soils: 4 percent of the unit
Cozberg and similar soils: 3 percent of the unit
Sixbeacon and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

859C—Yetull loamy fine sand, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 4,200 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Yetull and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, hills
Slope: 2 to 8 percent
Surface layer texture: Loamy fine sand
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Sandy eolian deposits
Sandy slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Additional Components

Yetull, stony, and similar soils: 3 percent of the unit
Cozberg and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

872E—Kobarter-Abor, stony, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,200 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Kobarter and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls
Slope: 15 to 35 percent
Surface layer texture: Gravelly clay loam
Restrictive feature: None noted
Drainage class: Well drained

Parent material: Clayey slope alluvium derived from semiconsolidated shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.0 inches

Abor and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Hills, knolls, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly clay
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
- Calcareous, clayey slope alluvium over residuum derived from semiconsolidated shale-siltstone
- Calcareous, clayey residuum derived from semiconsolidated shale-siltstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.8 inches

Additional Components

Bronec and similar soils: 3 percent of the unit
Delpoint and similar soils: 3 percent of the unit
Ethridge and similar soils: 3 percent of the unit
Brocko and similar soils: 2 percent of the unit
Shoddy and similar soils: 2 percent of the unit
Varney and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

911C—Absarook-Martinsdale, stony, complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Absarook and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Fine-loamy colluvium over residuum derived from sandstone
- Residuum derived from basalt
- Fine-loamy slope alluvium over residuum derived from basalt
- Residuum derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.9 inches

Martinsdale and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Calcareous, fine-loamy alluvium derived from granite
- Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Additional Components

Absarook loam and similar soils: 5 percent of the unit
Martinsdale, very stony, and similar soils: 5 percent of the unit
Devilfence and similar soils: 3 percent of the unit
Shawmut and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

915C—Quincreek channery loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Quincreek and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls
Slope: 2 to 8 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Calcareous, gravelly residuum derived from hard, red shale
Calcareous, gravelly slope alluvium over residuum derived from hard, red shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.8 inches

Additional Components

Quaint and similar soils: 2 percent of the unit
Redfist and similar soils: 2 percent of the unit
Rock outcrop: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

941E—Tigeron, bouldery-Tigeron, very bouldery, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tigeron, bouldery, and similar soils

Extent: 65 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges, saddles
Slope: 15 to 45 percent
Surface layer texture: Extremely gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.3 inches

Tigeron, very bouldery, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges, saddles
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.4 inches

Additional Components

Tigeron, very stony, and similar soils: 7 percent of the unit
Redfern and similar soils: 5 percent of the unit
Warwood and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

942E—Tigeron extremely gravelly loam, 15 to 35 percent slopes, bouldery

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tigeron and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges, saddles
Slope: 15 to 35 percent
Surface layer texture: Extremely gravelly loam

Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.3 inches

Additional Components

Tigeron, very stony, and similar soils: 7 percent of the unit
Warwood and similar soils: 5 percent of the unit
Redfern and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

943F—Tigeron, stony-Tigeron, very stony, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tigeron, stony, and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges, saddles
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.0 inches

Tigeron, very stony, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges, saddles
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.0 inches

Additional Components

Cowood and similar soils: 7 percent of the unit
Tigeron, extremely gravelly, and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

944E—Tigeron, very bouldery-Redfern, bouldery-Rock outcrop complex, 15 to 45 percent slopes, warm

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tigeron and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges, saddles
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained

Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.0 inches

Redfern and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, mountain slopes, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.1 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Additional Components

Tigeron, very stony, and similar soils: 5 percent of the unit
Warwood and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

945E—Tigeron, very bouldery-Redfern, bouldery-Rock outcrop complex, 15 to 45 percent slopes, dry

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tigeron and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges, saddles
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.0 inches

Redfern and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Divides, escarpments, mountain slopes, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.1 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Additional Components

Tigeron soils that have slopes of more than 45 percent: 7 percent of the unit
Libeg and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

946F—Tigeron, very stony-Redfern, rubbly-Rock outcrop complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tigeron and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges, saddles
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.0 inches

Redfern and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Rock outcrop

Extent: 8 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Rubble land: 7 percent of the unit
Libeg and similar soils: 6 percent of the unit
Nieman and similar soils: 5 percent of the unit
Worock and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

947F—Tigeron, very stony-Redfern, rubbly-Rock outcrop complex, 25 to 60 percent slopes, dry

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tigeron and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges, saddles
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.0 inches

Redfern and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)

Drainage class: Well drained
Parent material: Gravelly residuum derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Rock outcrop

Extent: 8 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Rubble land: 7 percent of the unit
Libeg and similar soils: 6 percent of the unit
Nieman and similar soils: 5 percent of the unit
Worock and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

952F—Redfern, bouldery-Rock outcrop-Tigeron, very bouldery, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Redfern and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, escarpments, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.1 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Tigeron and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges, saddles
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.0 inches

Additional Components

Elve and similar soils: 4 percent of the unit
Cowood and similar soils: 2 percent of the unit
Libeg and similar soils: 2 percent of the unit
Nieman and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

953F—Redfern, rubbly-Rock outcrop-Rubble land association, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Redfern and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Divides, escarpments, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)

Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Rubble land

Extent: 15 percent of the map unit
Definition: This component consists of extensive areas of hard, fine grained, angular volcanic cobbles, stones, and boulders.

Additional Components

Tigeron and similar soils: 4 percent of the unit
Elve and similar soils: 3 percent of the unit
Helmville and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

954F—Redfern, rubbly-Rock outcrop-Tigeron, very bouldery, complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 30 inches
Frost-free period: 30 to 70 days

Component Description

Redfern and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, escarpments, mountain slopes, ridges
Slope: 35 to 70 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Tigeron and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges, saddles
Slope: 35 to 70 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.0 inches

Additional Components

Tigeron soils that have slopes of less than 35 percent: 8 percent of the unit
Elve and similar soils: 7 percent of the unit
Rubble land: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

963E—Elve-Warwood complex, 15 to 45 percent slopes, stony

Map Unit Setting

Landscape: Mountains
Elevation: 6,000 to 8,500 feet
Mean annual precipitation: 20 to 30 inches
Frost-free period: 30 to 60 days

Component Description

Elve and similar soils

Extent: 50 percent of the map unit

Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.4 inches

Warwood and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 45 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 7.7 inches

Additional Components

Worock and similar soils: 6 percent of the unit
Cowood and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Rubble land: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

964E—Elve, very stony-Elve, rubbly-Cowood, rubbly, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 6,500 to 8,500 feet
Mean annual precipitation: 20 to 30 inches
Frost-free period: 30 to 60 days

Component Description

Elve, very stony, and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Elve, rubbly, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 15 to 35 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Cowood and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, mountainsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Worock and similar soils: 5 percent of the unit
Rock outcrop: 3 percent of the unit
Rubble land: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

964F—Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes, cool

Map Unit Setting

Landscape: Mountains
Elevation: 6,500 to 8,500 feet
Mean annual precipitation: 20 to 30 inches
Frost-free period: 30 to 60 days

Component Description

Elve and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Cowood and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, mountainsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Rubble land: 10 percent of the unit
Worock and similar soils: 10 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

965E—Elve, very stony-Cowood, rubbly, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Elve and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Cowood and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, mountainsides, ridges
Slope: 15 to 35 percent

Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Rock outcrop: 5 percent of the unit
Rubble land: 5 percent of the unit
Worock and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

965F—Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes, dry

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Elve and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Cowood and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, mountainsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Flooding: None
Available water capacity: Mainly 0.9 inch

Rock outcrop

Extent: 8 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Rubble land: 7 percent of the unit
Worock and similar soils: 7 percent of the unit
Elvick and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

966E—Elve, very stony-Rock outcrop-Rubble land complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,500 feet
Mean annual precipitation: 15 to 30 inches
Frost-free period: 30 to 70 days

Component Description

Elve and similar soils

Extent: 70 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained

Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Rubble land

Extent: 10 percent of the map unit
Definition: This component consists of extensive areas of hard, fine grained, angular volcanic cobbles, stones, and boulders.

Additional Components

Cowood and similar soils: 4 percent of the unit
Elvick and similar soils: 3 percent of the unit
Worock and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

967F—Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 6,500 to 8,500 feet
Mean annual precipitation: 20 to 30 inches
Frost-free period: 30 to 60 days

Component Description

Elve and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Cowood and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, mountainsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Rubble land: 10 percent of the unit
Worock and similar soils: 10 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

968E—Elve, stony-Worock complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Elve and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 15 to 35 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)

Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.6 inches

Worock and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 15 to 35 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly till derived from fine grained igneous and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Cowood and similar soils: 3 percent of the unit
Elvick and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit
Rubble land: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

968F—Elve, stony-Worock complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Elve and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.6 inches

Worock and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly till derived from fine grained igneous and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Cowood and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Rubble land: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

969F—Elve, bouldery-Worock-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet

Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Elve and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Stony loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.4 inches

Worock and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly till derived from fine grained igneous and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.7 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Additional Components

Cowood and similar soils: 5 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

971F—Cowood, rubbly-Rock outcrop association, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,500 feet
Mean annual precipitation: 15 to 30 inches
Frost-free period: 30 to 70 days

Component Description

Cowood and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, mountainsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary and metamorphic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Elve and similar soils: 6 percent of the unit
Tigeron and similar soils: 5 percent of the unit
Arrowpeak and similar soils: 3 percent of the unit
Redfern and similar soils: 3 percent of the unit
Sigbird and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

972F—Cowood, very bouldery-Kimpton, very bouldery-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Cowood and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, mountainsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Kimpton and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from basalt
Gravelly colluvium over residuum derived from fine grained sandstone
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Gravelly slope alluvium over residuum derived from basalt
Gravelly slope alluvium over residuum derived from fine grained sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.2 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary and metamorphic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Surdal and similar soils: 5 percent of the unit
Tigeron and similar soils: 4 percent of the unit
Redfern and similar soils: 3 percent of the unit
Tiban and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

973D—Cowood, very stony-Elve, very stony-Rock outcrop complex, 4 to 25 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,500 feet
Mean annual precipitation: 15 to 30 inches
Frost-free period: 30 to 70 days

Component Description

Cowood and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, mountainsides, ridges
Slope: 4 to 25 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent covered by stones; 15 to 50 percent covered by boulders
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.0 inch

Elve and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 4 to 25 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Rubble land: 10 percent of the unit
Arrowpeak and similar soils: 6 percent of the unit
Tigeron and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

982F—Kimpton, very bouldery-Rock outcrop-Tiban, very bouldery, complex, 25 to 50 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Kimpton and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 25 to 50 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from basalt
Gravelly colluvium over residuum derived from fine grained sandstone
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Gravelly slope alluvium over residuum derived from basalt
Gravelly slope alluvium over residuum derived from fine grained sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.2 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary and metamorphic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Tiban and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 25 to 50 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Cheadle and similar soils: 6 percent of the unit
Helmville and similar soils: 5 percent of the unit
Ratiopeak and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

991E—Libeg loam, 15 to 35 percent slopes, bouldery

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Libeg and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 15 to 35 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Forest land
Flooding: None
Water table: Within a depth of 60 inches
Available water capacity: Mainly 4.9 inches

Additional Components

Monaberg and similar soils: 10 percent of the unit
Elvick and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

992E—Libeg, very bouldery-Libeg, bouldery-Nieman, bouldery, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 30 inches
Frost-free period: 30 to 70 days

Component Description

Libeg, very bouldery, and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Libeg, bouldery, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Nieman and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Additional Components

Ratiopeak and similar soils: 2 percent of the unit
Sebud and similar soils: 2 percent of the unit
Surdal and similar soils: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

993D—Ratiopeak-Tiban gravelly loams, 4 to 15 percent slopes, bouldery

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Ratiopeak and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from sandstone
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Tiban and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.0 inches

Additional Components

Cheadle and similar soils: 5 percent of the unit
Rock outcrop: 3 percent of the unit
Kimpton and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

994E—Libeg, stony-Nieman, bouldery, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Libeg and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Nieman and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)

Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Additional Components

Libeg, very bouldery, and similar soils: 10 percent of the unit
Monaberg and similar soils: 5 percent of the unit
Rock outcrop: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

996D—Libeg-Monaberg gravelly loams, 2 to 15 percent slopes, bouldery

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Libeg and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 2 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Monaberg and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from basalt
Fine-loamy slope alluvium derived from fine grained igneous and metamorphic rocks
Fine-loamy alpine till derived from fine grained igneous and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.6 inches

Additional Components

Sebud and similar soils: 5 percent of the unit
Marcel and similar soils: 4 percent of the unit
Nieman and similar soils: 3 percent of the unit
Tibkey and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

997E—Libeg, stony-Monaberg-Adel complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Libeg and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 15 to 35 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None

Available water capacity: Mainly 4.9 inches

Monaberg and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Fine-loamy slope alluvium derived from basalt
- Fine-loamy slope alluvium derived from fine grained igneous and metamorphic rocks
- Fine-loamy alpine till derived from fine grained igneous and metamorphic rocks

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.8 inches

Adel and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Fans, mountainsides
Slope: 15 to 35 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly slope alluvium
- Fine-loamy alluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.5 inches

Additional Components

Adel soils that have slopes of less than 15 percent: 5 percent of the unit
Arrowpeak and similar soils: 5 percent of the unit
Libeg, very bouldery, and similar soils: 5 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

998E—Libeg-Nieman, stony, complex, 8 to 25 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 30 inches
Frost-free period: 30 to 70 days

Component Description

Libeg and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 8 to 25 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly alluvium
- Gravelly colluvium
- Gravelly slope alluvium
- Gravelly till

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Nieman and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 8 to 25 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly residuum derived from basalt
- Gravelly residuum derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Rock outcrop: 5 percent of the unit
Sebud and similar soils: 4 percent of the unit
Arrowpeak and similar soils: 2 percent of the unit
Marcel and similar soils: 2 percent of the unit
Surdal and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

999E—Libeg, very stony-Libeg, very bouldery, complex, 4 to 25 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Libeg, very stony, and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 4 to 25 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Libeg, very bouldery, and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 4 to 25 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Additional Components

Nieman and similar soils: 3 percent of the unit
Sebud and similar soils: 3 percent of the unit
Marcel and similar soils: 2 percent of the unit
Worock and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

999F—Libeg, very stony-Libeg, rubbly, association, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Libeg, very stony, and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Libeg, rubbly, and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 25 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.5 inches

Additional Components

Nieman and similar soils: 3 percent of the unit
Sebud and similar soils: 3 percent of the unit
Marcel and similar soils: 2 percent of the unit
Rock outcrop: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1003E—Tiban, bouldery-Cheadle, very bouldery, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tiban and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.0 inches

Cheadle and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Additional Components

Ratiopeak and similar soils: 6 percent of the unit
Kimpton and similar soils: 4 percent of the unit
Surdal and similar soils: 4 percent of the unit
Tibkey and similar soils: 4 percent of the unit
Rock outcrop: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1004E—Tiban, rubbly-Tiban, very bouldery-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tiban, rubbly, and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 45 percent
Surface layer texture: Extremely stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.3 inches

Tiban, very bouldery, and similar soils

Extent: 30 percent of the map unit

Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Nieman and similar soils: 6 percent of the unit
Rubble land: 5 percent of the unit
Helmville and similar soils: 5 percent of the unit
Libeg and similar soils: 4 percent of the unit
Ratiopeak and similar soils: 3 percent of the unit
Cheadle and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1101E—Monaberg, stony-Libeg, bouldery, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Monaberg and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from basalt
Fine-loamy slope alluvium derived from fine grained igneous and metamorphic rocks
Fine-loamy alpine till derived from fine grained igneous and metamorphic rocks
Flooding: None
Available water capacity: Mainly 8.8 inches

Libeg and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 15 to 35 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (bouldery)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Forest land
Flooding: None
Water table: Within a depth of 60 inches
Available water capacity: Mainly 4.9 inches

Additional Components

Branham and similar soils: 5 percent of the unit
Lowder and similar soils: 5 percent of the unit
Redfern and similar soils: 5 percent of the unit
Tigeron and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1102B—Adel-Libeg, stony, complex, 1 to 4 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Adel and similar soils

Extent: 40 percent of the map unit

Geomorphic position: Fans, mountainsides
Slope: 1 to 4 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly slope alluvium
Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 7.9 inches

Libeg and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 1 to 4 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 4.7 inches

Additional Components

Tibkey and similar soils: 6 percent of the unit
Monaberg and similar soils: 5 percent of the unit
Tineman and similar soils: 5 percent of the unit
Sebud and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1103D—Adel-Libeg complex, 4 to 15 percent slopes, stony

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Adel and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Fans, mountainsides
Slope: 4 to 15 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly slope alluvium
Fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.9 inches

Libeg and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Additional Components

Monaberg and similar soils: 10 percent of the unit
Tiban and similar soils: 6 percent of the unit
Sebud and similar soils: 5 percent of the unit
Cheadle and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1104C—Adel loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet

Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Adel loam and similar soils

Extent: 80 percent of the map unit
Geomorphic position: Fans, mountainsides
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly slope alluvium
Fine-loamy alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.5 inches

Additional Components

Adel soils that have slopes of more than 8 percent: 10 percent of the unit
Libeg and similar soils: 5 percent of the unit
Monaberg and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1120E—Quaint channery loam, 8 to 35 percent slopes, very stony

Map Unit Setting

Landscape: Uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Quaint and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Hillsides, plateaus, ridges
Slope: 8 to 35 percent
Surface layer texture: Channery loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Calcareous, gravelly slope alluvium over residuum derived from hard, red shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.6 inches

Additional Components

Redfist and similar soils: 4 percent of the unit
Quincreek and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1121E—Quaint-Rock outcrop-Redfist complex, 4 to 25 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,000 to 6,500 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Quaint and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Hillsides, plateaus, ridges
Slope: 4 to 25 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Calcareous, gravelly slope alluvium over residuum derived from hard, red shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.6 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of areas of exposed hard, fractured shale bedrock. Flagstones litter the areas and accumulate at the base of hills and escarpments.

Redfist and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls
Slope: 4 to 15 percent
Surface layer texture: Channery loam

Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Calcareous, gravelly colluvium over residuum derived from hard, red shale
Calcareous, gravelly residuum derived from hard, red shale
Calcareous, gravelly slope alluvium over residuum derived from hard, red shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Additional Components

Quincreek and similar soils: 5 percent of the unit
Ferball and similar soils: 4 percent of the unit
Devilfence and similar soils: 3 percent of the unit
Wilspring and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1121F—Quaint-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Quaint and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Hillsides, plateaus, ridges
Slope: 15 to 45 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Calcareous, gravelly slope alluvium over residuum derived from hard, red shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.6 inches

Rock outcrop

Extent: 40 percent of the map unit
Definition: This component consists mainly of areas of exposed hard, fractured shale bedrock. Flagstones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Redfist and similar soils: 8 percent of the unit
Quincreek and similar soils: 6 percent of the unit
Devilfence and similar soils: 3 percent of the unit
Wilspring and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1122D—Quaint-Redfist channery loams, 4 to 15 percent slopes

Map Unit Setting

Landscape: Uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Quaint and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Hillsides, plateaus, ridges
Slope: 4 to 15 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Calcareous, gravelly slope alluvium over residuum derived from hard, red shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.6 inches

Redfist and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls
Slope: 4 to 15 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained

Parent material:
Calcareous, gravelly colluvium over residuum derived from hard, red shale
Calcareous, gravelly residuum derived from hard, red shale
Calcareous, gravelly slope alluvium over residuum derived from hard, red shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Additional Components

Quincreek and similar soils: 4 percent of the unit
Ferball and similar soils: 2 percent of the unit
Quaint, very stony, and similar soils: 2 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1131C—Redfist-Quaint channery loams, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Redfist and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls
Slope: 2 to 8 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Calcareous, gravelly colluvium over residuum derived from hard, red shale
Calcareous, gravelly residuum derived from hard, red shale
Calcareous, gravelly slope alluvium over residuum derived from hard, red shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Quaint and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Hillsides, plateaus, ridges
Slope: 2 to 8 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Calcareous, gravelly slope alluvium over residuum derived from hard, red shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.6 inches

Additional Components

Quincreek and similar soils: 5 percent of the unit
Martinsdale and similar soils: 4 percent of the unit
Devilfence and similar soils: 3 percent of the unit
Wilspring and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1131D—Redfist-Quaint channery loams, 8 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Redfist and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls
Slope: 8 to 15 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Calcareous, gravelly colluvium over residuum derived from hard, red shale
Calcareous, gravelly residuum derived from hard, red shale
Calcareous, gravelly slope alluvium over residuum derived from hard, red shale
Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 3.1 inches

Quaint and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Hillsides, plateaus, ridges
Slope: 8 to 15 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Calcareous, gravelly slope alluvium over residuum derived from hard, red shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.6 inches

Additional Components

Quincreek and similar soils: 6 percent of the unit
Devilfence and similar soils: 4 percent of the unit
Wilspring and similar soils: 4 percent of the unit
Martinsdale and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1132D—Redfist, bouldery-Perma, bouldery-Rock outcrop complex, 2 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Redfist and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls
Slope: 2 to 35 percent
Surface layer texture: Channery loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Calcareous, gravelly colluvium over residuum derived from hard, red shale
Calcareous, gravelly residuum derived from hard, red shale
Calcareous, gravelly slope alluvium over residuum derived from hard, red shale
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.1 inches

Perma and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 2 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.5 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary and metamorphic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Whitlash and similar soils: 7 percent of the unit
Windham and similar soils: 6 percent of the unit
Quaint and similar soils: 4 percent of the unit
Perma, very bouldery, and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1141D—Devilfence very channery loam, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Special feature: Delineations of this map unit in the Black Butte quad area generally do not have lime.

Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Devilfence and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Very channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Gravelly residuum derived from shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Rock outcrop: 3 percent of the unit
Vigilante and similar soils: 3 percent of the unit
Wilspring and similar soils: 2 percent of the unit
Quincreek and similar soils: 1 percent of the unit
Redfist and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1142E—Devilfence-Rock outcrop-Wilspring complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Devilfence and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Very channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Gravelly residuum derived from shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of areas of exposed hard, fractured shale bedrock. Flagstones litter the areas and accumulate at the base of hills and escarpments.

Wilspring and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Calcareous, gravelly colluvium over residuum derived from claystone
Calcareous, gravelly colluvium over residuum derived from shale
Calcareous, gravelly residuum derived from shale
Calcareous, gravelly slope alluvium over residuum derived from claystone
Calcareous, gravelly slope alluvium over residuum derived from shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Additional Components

Vigilante and similar soils: 6 percent of the unit
Quincreek and similar soils: 5 percent of the unit
Wimper and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1142F—Devilfence-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Special feature: Delineations of this map unit in the Black Butte quad area generally do not have lime.
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Devilfence and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Gravelly residuum derived from shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Rock outcrop

Extent: 35 percent of the map unit
Definition: This component consists mainly of areas of exposed hard, fractured shale bedrock. Flagstones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Quincreek and similar soils: 6 percent of the unit
Wilspring and similar soils: 6 percent of the unit
Vigilante and similar soils: 5 percent of the unit
Redfist and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1143F—Deville-Wilde-Rock outcrop complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Deville and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Very channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Gravelly residuum derived from shale-siltstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Wilde and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 25 to 45 percent
Surface layer texture: Very channery loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from claystone
Gravelly colluvium over residuum derived from shale
Gravelly residuum derived from shale
Gravelly slope alluvium over residuum derived from claystone
Gravelly slope alluvium over residuum derived from shale
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.0 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of areas of exposed hard, fractured shale bedrock. Flagstones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Vigilante and similar soils: 4 percent of the unit
Devilfence and similar soils: 3 percent of the unit
Redfist and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1146E—Deville-Rock outcrop-Wilde complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Deville and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Very channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Gravelly residuum derived from shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Rock outcrop

Extent: 35 percent of the map unit
Definition: This component consists mainly of areas of exposed hard, fractured shale bedrock. Flagstones litter the areas and accumulate at the base of hills and escarpments.

Wilde and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly colluvium over residuum derived from claystone
- Gravelly colluvium over residuum derived from shale
- Gravelly residuum derived from shale
- Gravelly slope alluvium over residuum derived from claystone
- Gravelly slope alluvium over residuum derived from shale

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.1 inches

Additional Components

Vigilante and similar soils: 3 percent of the unit
Wimper and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1152D—Wilspring-Devilfence complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Special feature: Delineations of this map unit in the Black Butte quad area generally do not have lime.
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Wilspring and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Calcareous, gravelly colluvium over residuum derived from claystone
- Calcareous, gravelly colluvium over residuum derived from shale
- Calcareous, gravelly residuum derived from shale
- Calcareous, gravelly slope alluvium over residuum derived from claystone
- Calcareous, gravelly slope alluvium over residuum derived from shale

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Devilfence and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Very channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Gravelly residuum derived from shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Quincreek and similar soils: 7 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1152E—Wilspring-Devilfence-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Wilspring and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Calcareous, gravelly colluvium over residuum derived from claystone
Calcareous, gravelly colluvium over residuum derived from shale
Calcareous, gravelly residuum derived from shale
Calcareous, gravelly slope alluvium over residuum derived from claystone
Calcareous, gravelly slope alluvium over residuum derived from shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Devilfence and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Gravelly residuum derived from shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of areas of exposed hard, fractured shale bedrock. Flagstones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Quincreek and similar soils: 5 percent of the unit
Vigilante and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1153C—Wilspring-Quincreek-Devilfence complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Wilspring and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 8 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Calcareous, gravelly colluvium over residuum derived from claystone
Calcareous, gravelly colluvium over residuum derived from shale
Calcareous, gravelly residuum derived from shale
Calcareous, gravelly slope alluvium over residuum derived from claystone
Calcareous, gravelly slope alluvium over residuum derived from shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Quincreek and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls

Slope: 2 to 8 percent
Surface layer texture: Loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Calcareous, gravelly residuum derived from hard, red shale
Calcareous, gravelly slope alluvium over residuum derived from hard, red shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.9 inches

Devilfence and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 8 percent
Surface layer texture: Very channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Gravelly residuum derived from shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Rock outcrop: 4 percent of the unit
Vigilante and similar soils: 3 percent of the unit
Wimper and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1154E—Wilde-Deville-Vigilante complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Wilde and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Very channery loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from claystone
Gravelly colluvium over residuum derived from shale
Gravelly residuum derived from shale
Gravelly slope alluvium over residuum derived from claystone
Gravelly slope alluvium over residuum derived from shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.0 inches

Deville and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Very channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Gravelly residuum derived from shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Vigilante and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, interfluves, ridges
Slope: 8 to 35 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from shale over residuum derived from shale
Gravelly slope alluvium derived from claystone over residuum derived from claystone
Gravelly slope alluvium derived from shale over residuum derived from shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.9 inches

Additional Components

Rock outcrop: 4 percent of the unit of the unit

Wilde soils that have slopes of more than 35 percent: 3 percent of the unit
Wilspring and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1154F—Wilde, stony-Vigilante-Deville, very stony, complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Wilde and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Very channery loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly colluvium over residuum derived from claystone
- Gravelly colluvium over residuum derived from shale
- Gravelly residuum derived from shale
- Gravelly slope alluvium over residuum derived from claystone
- Gravelly slope alluvium over residuum derived from shale

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.0 inches

Vigilante and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, interfluves, ridges
Slope: 35 to 50 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from shale over residuum derived from shale
- Gravelly slope alluvium derived from claystone over residuum derived from claystone
- Gravelly slope alluvium derived from shale over residuum derived from shale

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.9 inches

Deville and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Very channery loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Gravelly residuum derived from shale-siltstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Wilde soils that are not stony: 6 percent of the unit
Perma and similar soils: 5 percent of the unit
Rock outcrop: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1161E—Yreka, bouldery-Hoyt, bouldery-Shaboom, very bouldery, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Yreka and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, mountain slopes, ridges

Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly colluvium derived from mixed, fine grained igneous, sedimentary, and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 7.1 inches

Hoyt and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides
Slope: 15 to 45 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from basalt
Fine-loamy slope alluvium derived from basalt
Fine-loamy till
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 9.1 inches

Shaboom and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Skyview and similar soils: 5 percent of the unit
Elmark and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1162E—Yreka very cobbly loam, 15 to 35 percent slopes, bouldery

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Yreka and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly colluvium derived from mixed, fine grained igneous, sedimentary, and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 7.0 inches

Additional Components

Skyview and similar soils: 5 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1163F—Ymark, very bouldery-Elmark, very bouldery-Rock outcrop complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Ymark and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Very cobbly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly colluvium derived from granite and fine grained igneous rock over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.6 inches

Elmark and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountainsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over sandy and gravelly residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.5 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Kellygulch and similar soils: 5 percent of the unit
Shaboom and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1164F—Yreka-Brickner, stony, complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Yreka and similar soils

Extent: 65 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, mountain slopes, ridges
Slope: 35 to 70 percent
Surface layer texture: Gravelly coarse sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly colluvium derived from mixed, fine grained igneous, sedimentary, and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 6.9 inches

Brickner and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Very gravelly loamy coarse sand
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Sawbuck and similar soils: 7 percent of the unit
Skyview and similar soils: 5 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1170E—Whitlash-Whitlash, stony-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Whitlash and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Whitlash, stony, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary and metamorphic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Sawicki and similar soils: 5 percent of the unit
Blaincreek and similar soils: 4 percent of the unit
Kadygulch and similar soils: 3 percent of the unit
Perma and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1171F—Castner, bouldery-Rock outcrop complex, 25 to 50 percent slopes

Map Unit Setting

Landscape: Uplands, foothills, valleys
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Castner and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Hills, hillsides, ridges
Slope: 25 to 50 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Rock outcrop

Extent: 35 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary and metamorphic

bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Wickes and similar soils: 5 percent of the unit
Perma and similar soils: 4 percent of the unit
Sieben and similar soils: 3 percent of the unit
Yetull and similar soils: 2 percent of the unit
Whitlash and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1172F—Castner, very bouldery-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Uplands, foothills, valleys
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Castner and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Hills, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Stony loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary and metamorphic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Tolbert and similar soils: 6 percent of the unit
Wickes and similar soils: 5 percent of the unit
Sieben and similar soils: 4 percent of the unit
Whitlash and similar soils: 3 percent of the unit
Yetull and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1180E—Farnuf loam, 15 to 35 percent slopes, stony

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Farnuf and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy alluvium derived from granite
Fine-loamy alluvium derived from sandstone-shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.7 inches

Additional Components

Quaint and similar soils: 3 percent of the unit
Wilspring and similar soils: 3 percent of the unit
Placerton and similar soils: 2 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1182C—Breeton gravelly loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, river valleys, valleys, uplands
Elevation: 3,940 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Breeton and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium derived from granite
Coarse-loamy colluvium derived from granite
Coarse-loamy slope alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.9 inches

Additional Components

Breeton soils that have slopes of more than 8 percent: 5 percent of the unit
Baxton and similar soils: 3 percent of the unit
Faith and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1191E—Silverchief very cobbly clay loam, 8 to 35 percent slopes, bouldery

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Silverchief and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, mountain slopes
Slope: 8 to 35 percent
Surface layer texture: Very cobbly clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Clayey slope alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 6.4 inches

Additional Components

Sawbuck and similar soils: 8 percent of the unit
Martinsdale and similar soils: 7 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1210C—Ferball clay loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 6,000 feet
Mean annual precipitation: 10 to 17 inches
Frost-free period: 80 to 115 days

Component Description

Ferball and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides
Slope: 2 to 8 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Fine-loamy alluvium derived from red shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 10.7 inches

Additional Components

Varney and similar soils: 4 percent of the unit
Quaint and similar soils: 3 percent of the unit
Redfist and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1222C—Martinsdale-Martinsdale, stony-Shawmut complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Martinsdale and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Cobbly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.1 inches

Martinsdale, stony, and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Shawmut and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 2 to 8 percent
Surface layer texture: Cobbly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.1 inches

Additional Components

Hilger and similar soils: 4 percent of the unit
Farnuf and similar soils: 3 percent of the unit
Judell and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1222E—Martinsdale-Martinsdale, stony-Shawmut complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Martinsdale and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Cobbly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.1 inches

Martinsdale, stony, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces

Slope: 15 to 35 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Shawmut and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 15 to 35 percent
Surface layer texture: Cobbly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.1 inches

Additional Components

Hilger and similar soils: 4 percent of the unit
Farnuf and similar soils: 3 percent of the unit
Windham and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1223D—Martinsdale-Shawmut complex, 2 to 15 percent slopes, bouldery

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Martinsdale and similar soils

Extent: 65 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 15 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Shawmut and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 2 to 15 percent
Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Additional Components

Shawmut, cobbly, and similar soils: 4 percent of the unit
Farnuf and similar soils: 3 percent of the unit
Hilger and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1242D—Baxton-Connieo, very bouldery-Rock outcrop complex, 4 to 15 percent slopes, moist

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Baxton and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Sandy colluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.1 inches

Connieo and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.9 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Clancy and similar soils: 5 percent of the unit
Burtoner and similar soils: 4 percent of the unit
Breeton and similar soils: 3 percent of the unit
Elmark and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1242E—Baxton-Connieo, very bouldery-Rock outcrop complex, 15 to 35 percent slopes, moist

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Baxton and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Sandy colluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.1 inches

Connieo and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.9 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Catgulch and similar soils: 5 percent of the unit
Elmark and similar soils: 4 percent of the unit
Breeton and similar soils: 3 percent of the unit
Burtoner and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1243D—Baxton-Connieo coarse sandy loams, 4 to 15 percent slopes, bouldery

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Baxton and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Sandy colluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Connieo and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Additional Components

Baxton soils that have slopes of more than 15 percent: 6 percent of the unit
Breeton and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Ashbray and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1244D—Baxton-Connieo, very bouldery-Rock outcrop complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Baxton and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Sandy colluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Connieo and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam

Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.9 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Breeton and similar soils: 3 percent of the unit
Catgulch and similar soils: 3 percent of the unit
Ashbray and similar soils: 2 percent of the unit
Burtoner and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1244E—Baxton-Connieo-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Baxton and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Sandy colluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Connieo and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.9 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Breeton and similar soils: 3 percent of the unit
Catgulch and similar soils: 3 percent of the unit
Ashbray and similar soils: 2 percent of the unit
Burtoner and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1245E—Baxton-Breeton-Connieo complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Baxton and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy loam

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Sandy colluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Breeton and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium derived from granite
Coarse-loamy colluvium derived from granite
Coarse-loamy slope alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.4 inches

Connieo and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Additional Components

Baxton soils that have slopes of less than 15 percent: 5 percent of the unit
Breeton soils that have slopes of less than 15 percent: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1246E—Baxton, stony-Breeton, bouldery-Catgulch, very stony, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Baxton and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Sandy colluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Breeton and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium derived from granite
Coarse-loamy colluvium derived from granite
Coarse-loamy slope alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.8 inches

Catgulch and similar soils

Extent: 15 percent of the map unit

Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 15 to 35 percent
Surface layer texture: Cobbly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Baxton soils that have slopes of less than 15 percent: 5 percent of the unit
Breeton soils that have slopes of less than 15 percent: 5 percent of the unit
Bielenberg and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1247E—Baxton-Kellygulch-Connieo complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Baxton and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Sandy colluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Kellygulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over residuum derived from granite
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.1 inches

Connieo and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Additional Components

Baxton soils that have slopes of less than 15 percent: 3 percent of the unit
Breeton and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit
Shaboom and similar soils: 3 percent of the unit
Skyview and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1250C—Work cobbly clay loam, 2 to 8 percent slopes, stony

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Work and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Cobbly clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, clayey alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Calcareous, gravelly outwash till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.1 inches

Additional Components

Martinsdale and similar soils: 4 percent of the unit
Quaint and similar soils: 3 percent of the unit
Wilspring and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1250E—Work very cobbly clay loam, 8 to 25 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Work and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 8 to 25 percent
Surface layer texture: Very cobbly clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, clayey alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Calcareous, gravelly outwash till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.1 inches

Additional Components

Martinsdale and similar soils: 6 percent of the unit
Perma and similar soils: 5 percent of the unit
Windham and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1271D—Placerton-Farnuf-Connieo complex, 8 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Placerton and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Divides, hillsides, mountain slopes, ridges
Slope: 8 to 15 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Farnuf and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 8 to 15 percent
Surface layer texture: Gravelly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy alluvium derived from granite
Fine-loamy alluvium derived from sandstone-shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.4 inches

Connieo and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 15 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.1 inches

Additional Components

Jeffcity and similar soils: 5 percent of the unit
Cedric and similar soils: 4 percent of the unit
Kounter and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1272D—Placerton-Connieo-Jeffcity complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Placerton and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Divides, hillsides, mountain slopes, ridges
Slope: 4 to 15 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Connieo and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.1 inches

Jeffcity and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.8 inches

Additional Components

Ashbray and similar soils: 2 percent of the unit
Cedric and similar soils: 2 percent of the unit
Farnuf and similar soils: 2 percent of the unit
Kounter and similar soils: 2 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1273E—Placerton-Farnuf-Breeton complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Placerton and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Divides, hillsides, mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.0 inches

Farnuf and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy alluvium derived from granite
Fine-loamy alluvium derived from sandstone-shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.7 inches

Breeton and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium derived from granite
Coarse-loamy colluvium derived from granite
Coarse-loamy slope alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.4 inches

Additional Components

Cedric and similar soils: 4 percent of the unit
Jeffcity and similar soils: 4 percent of the unit
Rock outcrop: 4 percent of the unit
Ashbray and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1275D—Placerton-Farnuf-Connieo gravelly sandy clay loams, 8 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Placerton and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Divides, hillsides, mountain slopes, ridges
Slope: 8 to 15 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Farnuf and similar soils

Extent: 25 percent of the map unit

Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 8 to 15 percent
Surface layer texture: Gravelly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy alluvium derived from granite
Fine-loamy alluvium derived from sandstone-shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.4 inches

Connieo and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 15 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.1 inches

Additional Components

Placerton soils that have slopes of more than 15 percent: 6 percent of the unit
Jeffcity and similar soils: 5 percent of the unit
Rock outcrop: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1275E—Placerton-Farnuf-Connieo complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Placerton and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Divides, hillsides, mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Farnuf and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy alluvium derived from granite
Fine-loamy alluvium derived from sandstone-shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.7 inches

Connieo and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.1 inches

Additional Components

Farnuf soils that have slopes of less than 15 percent: 6 percent of the unit
Rock outcrop: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1276D—Placerton-Connieo-Jeffcity complex, 4 to 15 percent slopes, warm

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Placerton and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Divides, hillsides, mountain slopes, ridges
Slope: 4 to 15 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Connieo and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.1 inches

Jeffcity and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.8 inches

Additional Components

Placerton soils that have slopes of more than 15 percent: 5 percent of the unit
Farnuf and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1277C—Placerton-Jeffcity complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Placerton and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Divides, hillsides, mountain slopes, ridges
Slope: 2 to 8 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.0 inches

Jeffcity and similar soils

Extent: 35 percent of the map unit

Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 8 percent
Surface layer texture: Loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.8 inches

Additional Components

Cedric and similar soils: 6 percent of the unit
Farnuf and similar soils: 4 percent of the unit
Kounter and similar soils: 4 percent of the unit
Ashbray and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1280D—Crackerville-Catgulch complex, 2 to 15 percent slopes, bouldery

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Crackerville and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from granite over sandy and gravelly residuum derived from granite
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.3 inches

Catgulch and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 2 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Additional Components

Burtoner and similar soils: 5 percent of the unit
Rock outcrop: 5 percent of the unit
Ashbray and similar soils: 4 percent of the unit
Baxton and similar soils: 3 percent of the unit
Breeton and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1281D—Crackerville-Catgulch, bouldery-Rock outcrop complex, 8 to 25 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Crackerville and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 25 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained

Parent material:
Gravelly colluvium derived from granite over sandy and gravelly residuum derived from granite
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.3 inches

Catgulch and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 8 to 25 percent
Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.1 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Ashbray and similar soils: 5 percent of the unit
Burtoner and similar soils: 5 percent of the unit
Kellygulch and similar soils: 4 percent of the unit
Baxton and similar soils: 3 percent of the unit
Breeton and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1282D—Crackerville-Bielenberg-Catgulch, bouldery, complex, 8 to 20 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Crackerville and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 15 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from granite over sandy and gravelly residuum derived from granite
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.3 inches

Bielenberg and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 40 to 50 inches to bedrock (paralithic); 50 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Catgulch and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 8 to 20 percent
Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.1 inches

Additional Components

Burtoner and similar soils: 6 percent of the unit
Connieo and similar soils: 5 percent of the unit
Clasoil and similar soils: 4 percent of the unit
Farnuf and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1283E—Crackerville-Bielenberg-Catgulch, bouldery, complex, 20 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Crackerville and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 20 to 35 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from granite over sandy and gravelly residuum derived from granite
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.3 inches

Bielenberg and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 20 to 35 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 40 to 50 inches to bedrock (paralithic); 50 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Catgulch and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 20 to 35 percent
Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.1 inches

Additional Components

Burtoner and similar soils: 5 percent of the unit
Connieo and similar soils: 4 percent of the unit
Clasoil and similar soils: 2 percent of the unit
Farnuf and similar soils: 2 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1286E—Crackerville-Bielenberg-Catgulch, bouldery, complex, 15 to 35 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Crackerville and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges

Slope: 15 to 35 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from granite over sandy and gravelly residuum derived from granite
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.3 inches

Bielenberg and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 40 to 50 inches to bedrock (paralithic); 50 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Catgulch and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 15 to 35 percent
Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.1 inches

Additional Components

Bielenberg soils that have slopes of less than 15 percent: 7 percent of the unit
Clancy and similar soils: 5 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1287E—Clancy, very stony-Crampton, bouldery-Bielenberg, very stony, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Clancy and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hills, ridges
Slope: 15 to 45 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Fine-loamy colluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.8 inches

Crampton and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hills, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained

Parent material:
Gravelly colluvium over sandy and gravelly residuum derived from granite
Gravelly residuum derived from granite
Gravelly slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.5 inches

Bielenberg and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 40 to 50 inches to bedrock (paralithic); 50 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.2 inches

Additional Components

Burtoner and similar soils: 5 percent of the unit
Baxton and similar soils: 3 percent of the unit
Connieo and similar soils: 3 percent of the unit
Bielenberg soils that have slopes of less than 15 percent: 2 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1321B—Beaverell, very stony-Beaverell-Sieberell, stony, complex, 1 to 4 percent slopes

Map Unit Setting

Landscape: Valleys, uplands, river valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Beaverell, very stony, and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, plains
Slope: 1 to 4 percent
Surface layer texture: Very cobbly sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.8 inches

Beaverell and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, plains
Slope: 1 to 4 percent
Surface layer texture: Very cobbly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.8 inches

Sieberell and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 1 to 4 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly slope alluvium over sandy and gravelly slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Additional Components

Attewan and similar soils: 3 percent of the unit
Geohrock and similar soils: 3 percent of the unit
Bronec and similar soils: 2 percent of the unit
Meadowcreek and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1321D—Beaverell, very stony-Sieberell, stony, complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Beaverell and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, plains
Slope: 4 to 15 percent
Surface layer texture: Very cobbly sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.8 inches

Sieberell and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly slope alluvium over sandy and gravelly slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Additional Components

Attewan and similar soils: 3 percent of the unit
Geohrock and similar soils: 3 percent of the unit
Bronec and similar soils: 2 percent of the unit
Sappington and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1322D—Beaverell, stony-Beaverell, rubbly-Sieberell, stony, complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Beaverell, stony, and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, plains
Slope: 2 to 15 percent
Surface layer texture: Extremely cobbly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.6 inches

Beaverell, rubbly, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, plains
Slope: 2 to 15 percent
Surface layer texture: Stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.8 inches

Sieberell and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 15 percent

Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, gravelly slope alluvium over sandy and gravelly slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Additional Components

Attewan and similar soils: 3 percent of the unit
Geohrock and similar soils: 3 percent of the unit
Bronec and similar soils: 2 percent of the unit
Sappington and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1331A—Bonebasin-Wetsand complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys, river valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 16 inches
Frost-free period: 90 to 115 days

Component Description

Bonebasin and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Drainageways, flood plains
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Organic material over fine-loamy alluvium and sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.6 inches

Wetsand and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 2 percent
Surface layer texture: Clay loam
Restrictive feature: None noted
Drainage class: Poorly drained
Parent material: Loamy alluvium over sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 3.7 inches

Additional Components

Riverrun and similar soils: 5 percent of the unit
Clunton and similar soils: 4 percent of the unit
Mckenton and similar soils: 3 percent of the unit
Meadowcreek and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1341D—Windham very gravelly loam, 2 to 15 percent slopes, very stony

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Windham and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.5 inches

Additional Components

Maiden and similar soils: 4 percent of the unit
Judell and similar soils: 3 percent of the unit
Lap and similar soils: 3 percent of the unit
Windham, very cobbly, and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1342E—Windham-Lap very cobbly loams, 15 to 45 percent slopes, bouldery

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Windham and similar soils

Extent: 65 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.9 inches

Lap and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Lap, very gravelly, and similar soils: 3 percent of the unit
Shawmut and similar soils: 3 percent of the unit
Maiden and similar soils: 2 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1343D—Windham-Judell very cobbly loams, 4 to 15 percent slopes, bouldery

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Windham and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.9 inches

Judell and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from limestone
Fine-loamy slope alluvium derived from limestone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.3 inches

Additional Components

Maiden and similar soils: 4 percent of the unit
Lap and similar soils: 3 percent of the unit
Shawmut and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1351D—Perma stony loam, 2 to 15 percent slopes, very bouldery

Map Unit Setting

Landscape: Uplands, foothills, mountains, river valleys
Elevation: 4,200 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Perma and similar soils

Extent: 80 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Stony loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.3 inches

Additional Components

Catgulch and similar soils: 5 percent of the unit
Placerton and similar soils: 5 percent of the unit
Whitlash and similar soils: 4 percent of the unit
Clunton and similar soils: 3 percent of the unit
Cometcrik and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1352E—Perma-Whitlash complex, 15 to 35 percent slopes, bouldery, warm

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Perma and similar soils

Extent: 70 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.4 inches

Whitlash and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Perma soils that have slopes of more than 35 percent: 4 percent of the unit
Sawicki and similar soils: 3 percent of the unit
Vigilante and similar soils: 3 percent of the unit
Wimper and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1353F—Perma, very stony-Whitlash, very stony-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Perma and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.4 inches

Whitlash and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary, metamorphic, and fine grained volcanic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Perma, cool, and similar soils: 6 percent of the unit
Perma, moist, and similar soils: 4 percent of the unit
Sawicki and similar soils: 4 percent of the unit
Vigilante and similar soils: 3 percent of the unit
Wimper and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1355D—Wimper-Wimper, stony, complex, 4 to 15 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Wimper and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained

Parent material:
Calcareous, gravelly colluvium derived from basalt
Calcareous, gravelly colluvium derived from fine grained sandstone
Calcareous, gravelly slope alluvium derived from basalt
Calcareous, gravelly slope alluvium derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.6 inches

Wimper, stony, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly colluvium derived from basalt
Calcareous, gravelly colluvium derived from fine grained sandstone
Calcareous, gravelly slope alluvium derived from basalt
Calcareous, gravelly slope alluvium derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Additional Components

Wimper soils that have slopes of more than 15 percent: 6 percent of the unit
Shawmut and similar soils: 5 percent of the unit
Windham and similar soils: 5 percent of the unit
Martinsdale and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1355E—Wimper-Wimper, stony, complex, 15 to 35 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Wimper and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly colluvium derived from basalt
Calcareous, gravelly colluvium derived from fine grained sandstone
Calcareous, gravelly slope alluvium derived from basalt
Calcareous, gravelly slope alluvium derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.6 inches

Wimper, stony, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly colluvium derived from basalt
Calcareous, gravelly colluvium derived from fine grained sandstone
Calcareous, gravelly slope alluvium derived from basalt
Calcareous, gravelly slope alluvium derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Additional Components

Wimper soils that have slopes of more than 35 percent: 7 percent of the unit
Shawmut and similar soils: 5 percent of the unit
Windham and similar soils: 5 percent of the unit
Martinsdale and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1356E—Wimper gravelly loam, 8 to 35 percent slopes, stony, moist

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Wimper and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 8 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly colluvium derived from basalt
Calcareous, gravelly colluvium derived from fine grained sandstone
Calcareous, gravelly slope alluvium derived from basalt
Calcareous, gravelly slope alluvium derived from fine grained sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.4 inches

Additional Components

Shawmut and similar soils: 8 percent of the unit
Windham and similar soils: 7 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1357F—Perma, very bouldery-Shaboom, extremely bouldery-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Uplands, foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Perma and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Stony loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.3 inches

Shaboom and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 3 to 15 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Kellygulch and similar soils: 10 percent of the unit
Baxton and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1361E—Lumpgulch, bouldery-Rock outcrop-Elmark, bouldery, complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Lumpgulch and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.3 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Elmark and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountainsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over sandy and gravelly residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.7 inches

Additional Components

Shaboom and similar soils: 6 percent of the unit
Kellygulch and similar soils: 5 percent of the unit
Connieo and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1362F—Lumpgulch, bouldery-Rock outcrop complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Lumpgulch and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.3 inches

Rock outcrop

Extent: 35 percent of the map unit

Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Elmark and similar soils: 6 percent of the unit
Shaboom and similar soils: 5 percent of the unit
Kellygulch and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1372D—Burtoner-Connieo, bouldery-Rock outcrop complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Burtoner and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Fine-loamy alluvium over residuum derived from granite
- Fine-loamy colluvium over residuum derived from granite
- Fine-loamy residuum derived from granite

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Connieo and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.3 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Baxton and similar soils: 5 percent of the unit
Breeton and similar soils: 3 percent of the unit
Ashbray and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1373E—Burtoner-Elmark-Connieo complex, 8 to 25 percent slopes, very bouldery

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Burtoner and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 15 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Fine-loamy alluvium over residuum derived from granite
- Fine-loamy colluvium over residuum derived from granite
- Fine-loamy residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.6 inches

Elmark and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountainsides, ridges
Slope: 8 to 25 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over sandy and gravelly residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.5 inches

Connieo and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.9 inches

Additional Components

Shaboom and similar soils: 5 percent of the unit
Rock outcrop: 4 percent of the unit
Ashbray and similar soils: 2 percent of the unit
Baxton and similar soils: 2 percent of the unit
Tolbert and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1374D—Burtoner-Clancy-Connieo complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Burtoner and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy alluvium over residuum derived from granite
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Clancy and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hills, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Fine-loamy colluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.2 inches

Connieo and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.1 inches

Additional Components

Burtoner soils that have slopes of more than 15 percent: 5 percent of the unit

Clancy soils that have slopes of more than 15 percent: 4 percent of the unit
Connieo soils that have slopes of more than 15 percent: 3 percent of the unit
Bielenberg and similar soils: 2 percent of the unit
Rock outcrop: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1375D—Burtoner-Connieo, bouldery-Rock outcrop complex, 4 to 15 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Burtoner and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy alluvium over residuum derived from granite
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Connieo and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.3 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Burtoner soils that have slopes of more than 15 percent: 3 percent of the unit of the unit
Clancy and similar soils: 3 percent of the unit
Bielenberg and similar soils: 2 percent of the unit
Crampton and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1375E—Burtoner, very stony-Connieo, bouldery-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Burtoner and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy alluvium over residuum derived from granite
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 3.2 inches

Connieo and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Clancy and similar soils: 7 percent
Crampton and similar soils: 5 percent
Bielenberg and similar soils: 3 percent

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1376F—Burtoner, very stony-Connieo, very stony-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Burtoner and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy alluvium over residuum derived from granite
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.1 inches

Connieo and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.9 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Ashbray and similar soils: 10 percent of the unit
Kellygulch and similar soils: 8 percent of the unit
Placerton and similar soils: 5 percent of the unit
Breeton and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1377E—Burtoner, very stony-Crampton, bouldery-Catgulch, bouldery, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet

Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Burtoner and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Fine-loamy alluvium over residuum derived from granite
- Fine-loamy colluvium over residuum derived from granite
- Fine-loamy residuum derived from granite

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Crampton and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hills, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly colluvium over sandy and gravelly residuum derived from granite
- Gravelly residuum derived from granite
- Gravelly slope alluvium over sandy and gravelly residuum derived from granite

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.7 inches

Catgulch and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 15 to 45 percent
Surface layer texture: Cobbly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Clancy and similar soils: 5 percent of the unit
Bielenberg and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Sawicki and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1378E—Burtoner-Elmark-Shaboom, very bouldery, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Burtoner and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Fine-loamy alluvium over residuum derived from granite
- Fine-loamy colluvium over residuum derived from granite
- Fine-loamy residuum derived from granite

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Elmark and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountainsides, ridges

Slope: 15 to 45 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over sandy and gravelly residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.7 inches

Shaboom and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Clancy and similar soils: 4 percent of the unit
Hoyt and similar soils: 3 percent of the unit
Placerton and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit
Bielenberg and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1381D—Jeffcity, stony-Connieo, stony-Rock outcrop complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Jeffcity and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.4 inches

Connieo and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.0 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Ashbray and similar soils: 4 percent of the unit
Cedric and similar soils: 4 percent of the unit
Connieo, bouldery, and similar soils: 4 percent of the unit
Connieo soils that are not stony: 4 percent of the unit
Placerton and similar soils: 4 percent of the unit

Management

• For information about managing this map unit,

see the appropriate sections in Part II of this publication.

1391B—Bronec fine sandy loam, 1 to 4 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Bronec and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, valley floors
Slope: 1 to 4 percent
Surface layer texture: Fine sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Sandy and gravelly, calcareous alluvium
- Sandy and gravelly, calcareous slope alluvium
- Sandy and gravelly, calcareous Tertiary valley fill alluvium
- Sandy and gravelly colluvium

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.9 inches

Additional Components

Beaverell and similar soils: 6 percent of the unit
Sieberell and similar soils: 5 percent of the unit
Bronec, stony, and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1451F—Blaincreek, very stony-Sawicki, very stony-Tolbert, very bouldery, complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Blaincreek and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly alluvium over residuum derived from basalt
- Gravelly colluvium over residuum derived from basalt
- Gravelly residuum derived from basalt
- Gravelly slope alluvium over residuum derived from basalt

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.4 inches

Sawicki and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, mountain slopes
Slope: 35 to 70 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from basalt
- Gravelly slope alluvium derived from basalt

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.3 inches

Tolbert and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 35 to 70 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)

Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Additional Components

Perma and similar soils: 3 percent of the unit
Wickes and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit
Sawbuck and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1460C—Clasoil loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Clasoil and similar soils

Extent: 80 percent of the map unit
Geomorphic position: Alluvial fans, hillsides
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Fine-loamy alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Additional Components

Farnuf and similar soils: 6 percent of the unit
Bielenberg and similar soils: 5 percent of the unit
Placerton and similar soils: 5 percent of the unit
Breeton and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1461D—Bielenberg-Burtoner, very stony-Catgulch, bouldery, complex, 8 to 25 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Bielenberg and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 8 to 15 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 40 to 50 inches to bedrock (paralithic); 50 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Burtoner and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 25 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy alluvium over residuum derived from granite
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Catgulch and similar soils

Extent: 15 percent of the map unit

Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 8 to 25 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Clancy and similar soils: 5 percent of the unit
Baxton and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1540F—Shaboom, extremely bouldery-Rock outcrop-Elmark, very bouldery, association, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Shaboom and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 3 to 15 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Elmark and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountainsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over sandy and gravelly residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.6 inches

Additional Components

Ashbray and similar soils: 6 percent of the unit
Lumpgulch and similar soils: 5 percent of the unit
Kellygulch and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1541E—Shaboom, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Shaboom and similar soils

Extent: 35 percent of the map unit

Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Lumpgulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 25 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.8 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Elmark and similar soils: 4 percent of the unit
Ashbray and similar soils: 3 percent of the unit
Kellygulch and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1542E—Shaboom, very bouldery-Rock outcrop-Kellygulch, very bouldery, complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Shaboom and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Kellygulch and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over residuum derived from granite
Coarse-loamy residuum derived from granite

Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.0 inches

Additional Components

Elmark and similar soils: 6 percent of the unit
Lumpgulch and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1543E—Shaboom, very bouldery-Kellygulch, very bouldery-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Shaboom and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Kellygulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over residuum derived from granite
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.0 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Ashbray and similar soils: 6 percent of the unit
Elmark and similar soils: 5 percent of the unit
Breeton and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1543F—Shaboom, extremely bouldery-Kellygulch, extremely bouldery-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Shaboom and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 3 to 15 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained

Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Kellygulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 3 to 15 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over residuum derived from granite
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.0 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Ashbray and similar soils: 6 percent of the unit
Elmark and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1544E—Shaboom, bouldery-Kellygulch, bouldery-Rock outcrop complex, 8 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Shaboom and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 45 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Kellygulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 45 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over residuum derived from granite
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.0 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Elmark and similar soils: 6 percent of the unit
Lumpgulch and similar soils: 5 percent of the unit
Hoyt and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1563D—Hilger, rubbly-Hilger complex, 8 to 25 percent slopes

Map Unit Setting

Landscape: Uplands, foothills, valleys
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Hilger, rubbly, and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 8 to 25 percent
Surface layer texture: Stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from fine grained sandstone
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.0 inches

Hilger and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 8 to 25 percent
Surface layer texture: Very cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from fine grained sandstone
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.2 inches

Additional Components

Shawmut and similar soils: 5 percent of the unit
Tolbert and similar soils: 4 percent of the unit
Sieben and similar soils: 3 percent of the unit
Brickner and similar soils: 2 percent of the unit
Rock outcrop: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1564E—Hilger, very stony-Hilger, rubbly-Rock outcrop complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Hilger, very stony, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from fine grained sandstone
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.2 inches

Hilger, rubbly, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 8 to 35 percent
Surface layer texture: Stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from fine grained sandstone
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.0 inches

Rock outcrop

Extent: 8 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Rubble land: 7 percent of the unit
Martinsdale and similar soils: 5 percent of the unit
Shawmut and similar soils: 5 percent of the unit
Wickes and similar soils: 5 percent of the unit
Brickner and similar soils: 4 percent of the unit
Tolbert and similar soils: 4 percent of the unit
Gnojek and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1591E—Catgulch, bouldery-Crackerville-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Catgulch and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 15 to 45 percent
Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.1 inches

Crackerville and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from granite over sandy and gravelly residuum derived from granite
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.3 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Baxton and similar soils: 2 percent of the unit
Breeton and similar soils: 2 percent of the unit
Burtoner and similar soils: 2 percent of the unit

Connieo and similar soils: 2 percent of the unit
Elmark and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1595E—Connieo, bouldery-Crackerville-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Connieo and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.3 inches

Crackerville and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from granite over sandy and gravelly residuum derived from granite
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.3 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Burtoner and similar soils: 7 percent of the unit
Bielenberg and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1596C—Connieo-Rock outcrop-Placerton complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Connieo and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 8 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Placerton and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Divides, hillsides, mountain slopes, ridges

Slope: 2 to 8 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.0 inches

Additional Components

Jeffcity and similar soils: 5 percent of the unit
Baxton and similar soils: 3 percent of the unit
Bielenberg and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1602C—Farnuf-Placerton sandy clay loams, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Farnuf and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy alluvium derived from granite
Fine-loamy alluvium derived from sandstone-shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.7 inches

Placerton and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Divides, hillsides, mountain slopes, ridges
Slope: 2 to 8 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Additional Components

Kounter and similar soils: 4 percent of the unit
Connieo and similar soils: 3 percent of the unit
Martinsdale and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1603C—Farnuf sandy loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains, river valleys, valleys
Elevation: 3,940 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Farnuf and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy alluvium derived from granite
Fine-loamy alluvium derived from sandstone-shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.4 inches

Additional Components

Faith and similar soils: 2 percent of the unit
Placerton and similar soils: 2 percent of the unit
Martinsdale and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1604D—Farnuf-Farnuf, stony-Burtoner complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Farnuf and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy alluvium derived from granite
Fine-loamy alluvium derived from sandstone-shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.7 inches

Farnuf, stony, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy alluvium derived from granite
Fine-loamy alluvium derived from sandstone-shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.7 inches

Burtoner and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy alluvium over residuum derived from granite
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Additional Components

Placerton and similar soils: 5 percent of the unit
Kounter and similar soils: 4 percent of the unit
Breeton and similar soils: 3 percent of the unit
Clancy and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1605C—Farnuf-Placerton sandy clay loams, 2 to 8 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Farnuf and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy alluvium derived from granite
Fine-loamy alluvium derived from sandstone-shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.7 inches

Placerton and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Divides, hillsides, mountain slopes, ridges
Slope: 2 to 8 percent

Surface layer texture: Sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Additional Components

Jeffcity and similar soils: 7 percent of the unit
Connieo and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1606D—Farnuf loam, 2 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Farnuf and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy alluvium derived from granite
Fine-loamy alluvium derived from sandstone-shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.7 inches

Additional Components

Connieo and similar soils: 4 percent of the unit
Placerton and similar soils: 4 percent of the unit
Martinsdale and similar soils: 3 percent of the unit
Bielenberg and similar soils: 2 percent of the unit
Burtoner and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1607D—Farnuf-Placerton-Martinsdale complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Farnuf and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy alluvium derived from granite
Fine-loamy alluvium derived from sandstone-shale
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.7 inches

Placerton and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Divides, hillsides, mountain slopes, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.0 inches

Martinsdale and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Loam

Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Additional Components

Connieo and similar soils: 3 percent of the unit
Kounter and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1621D—Connieo, stony-Baxton, stony-Rock outcrop complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Connieo and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.0 inches

Baxton and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Sandy colluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Ashbray and similar soils: 2 percent of the unit
Clancy and similar soils: 2 percent of the unit
Connieo soils that are not stony: 2 percent of the unit
Farnuf and similar soils: 2 percent of the unit
Placerton and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1621E—Connieo, very stony-Baxton, stony-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Connieo and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy loam

Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.0 inches

Baxton and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Sandy colluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Ashbray and similar soils: 3 percent of the unit
Catgulch and similar soils: 3 percent of the unit
Breeton and similar soils: 2 percent of the unit
Jeffcity and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1622D—Connieo, moist-Rock outcrop complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Connieo and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.9 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Ashbray and similar soils: 6 percent of the unit
Baxton and similar soils: 5 percent of the unit
Burtoner and similar soils: 5 percent of the unit
Breeton and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1623D—Connieo-Burtoner complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Connieo and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Coarse sandy loam

Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Burtoner and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Fine-loamy alluvium over residuum derived from granite
- Fine-loamy colluvium over residuum derived from granite
- Fine-loamy residuum derived from granite

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Additional Components

Kellygulch and similar soils: 6 percent of the unit
Breeton and similar soils: 4 percent of the unit
Placerton and similar soils: 3 percent of the unit
Ashbray and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1623E—Connieo-Baxton-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Connieo and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.9 inches

Baxton and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
- Coarse-loamy residuum derived from granite
- Coarse-loamy slope alluvium derived from granite over residuum derived from granite
- Sandy colluvium derived from granite over residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.6 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Kellygulch and similar soils: 6 percent of the unit
Ashbray and similar soils: 4 percent of the unit
Breeton and similar soils: 3 percent of the unit
Jeffcity and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1624F—Connieo, very stony-Baxton, bouldery-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Connieo and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.9 inches

Baxton and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Sandy colluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.1 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Ashbray and similar soils: 6 percent of the unit
Breeton and similar soils: 4 percent of the unit
Jeffcity and similar soils: 3 percent of the unit
Kellygulch and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1625F—Connieo, extremely bouldery-Rock outcrop-Burtoner, extremely stony, complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Connieo and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 3 to 15 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.7 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Burtoner and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 50 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 3 to 15 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy alluvium over residuum derived from granite

Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.2 inches

Additional Components

Ashbray and similar soils: 6 percent of the unit
Shaboom and similar soils: 4 percent of the unit
Kellygulch and similar soils: 3 percent of the unit
Breeton and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1626D—Connieo, bouldery-Burtoner, bouldery-Rock outcrop complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Connieo and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Burtoner and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy alluvium over residuum derived from granite
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Ashbray and similar soils: 4 percent of the unit
Baxton and similar soils: 4 percent of the unit
Bielenberg and similar soils: 4 percent of the unit
Breeton and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1627E—Connieo, very bouldery-Burtoner-Rock outcrop complex, 8 to 35 percent slopes, moist

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Connieo and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)

Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.1 inches

Burtoner and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 15 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy alluvium over residuum derived from granite
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.6 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Placerton and similar soils: 6 percent of the unit
Clancy and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1628D—Connieo, bouldery-Ashbray, very bouldery-Rock outcrop complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Connieo and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Ashbray and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.0 inch

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock.

Additional Components

Rubble land: 10 percent of the unit
Catgulch and similar soils: 4 percent of the unit
Breeton and similar soils: 3 percent of the unit
Jeffcity and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1629C—Connieo-Catgulch-Rock outcrop complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet

Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Connieo and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 8 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Catgulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 2 to 8 percent
Surface layer texture: Gravelly coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Bielenberg and similar soils: 2 percent of the unit
Breeton and similar soils: 2 percent of the unit
Burtoner and similar soils: 2 percent of the unit
Clancy and similar soils: 2 percent of the unit
Crackerville and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1640D—Nieman, very stony-Rock outcrop-Libeg, stony, complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 30 inches
Frost-free period: 30 to 70 days

Component Description

Nieman and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 2 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Libeg and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 2 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium

Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Additional Components

Surdal and similar soils: 5 percent of the unit
Marcel and similar soils: 4 percent of the unit
Sebud and similar soils: 3 percent of the unit
Tibkey and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1641E—Nieman, very stony-Rock outcrop-Libeg, bouldery, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Nieman and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Libeg and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Additional Components

Redfern and similar soils: 3 percent of the unit
Tigeron and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1641F—Nieman, very stony-Rock outcrop-Libeg, very stony, complex, 45 to 70 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Nieman and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 45 to 70 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt

Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Libeg and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 45 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Additional Components

Redfern and similar soils: 4 percent of the unit
Arrowpeak and similar soils: 3 percent of the unit
Surdal and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1642F—Nieman, bouldery-Rock outcrop-Libeg, very bouldery, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Nieman and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.0 inch

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Libeg and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.3 inches

Additional Components

Tigeron and similar soils: 4 percent of the unit
Redfern and similar soils: 3 percent of the unit
Surdal and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1643E—Nieman, stony-Libeg complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Nieman and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Libeg and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Additional Components

Rock outcrop: 4 percent of the unit
Arrowpeak and similar soils: 3 percent of the unit
Surdal and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1643F—Nieman, stony-Libeg-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Nieman and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 35 to 60 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Libeg and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 35 to 60 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Additional Components

Surdal and similar soils: 3 percent of the unit
Worock and similar soils: 3 percent of the unit
Libeg, very bouldery, and similar soils: 2 percent of the unit
Sebud and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1651C—Sawbuck-Sawbuck, very stony-Clasoil complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Sawbuck and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, mountain slopes
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 46 to 60 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt over residuum derived from granite
Gravelly colluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Sawbuck, very stony, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, mountain slopes
Slope: 2 to 8 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 46 to 60 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt over residuum derived from granite
Gravelly colluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Clasoil and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Fine-loamy alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.9 inches

Additional Components

Sawicki and similar soils: 6 percent of the unit
Clasoil, very bouldery, and similar soils: 5 percent of the unit
Breeton and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1652E—Sawicki-Clasoil complex, 8 to 35 percent slopes, bouldery

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Sawicki and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, mountain slopes
Slope: 8 to 35 percent

Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.1 inches

Clasoil and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides
Slope: 8 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Fine-loamy alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.9 inches

Additional Components

Blaincreek and similar soils: 5 percent of the unit
Tolbert and similar soils: 4 percent of the unit
Mocmont and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1654E—Sawicki, stony-Blaincreek-Tolbert, very stony, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Sawicki and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, mountain slopes
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.1 inches

Blaincreek and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly alluvium over residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from basalt
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.6 inches

Tolbert and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 15 to 45 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Blaincreek, very stony, and similar soils: 6 percent of the unit

Clasoil and similar soils: 5 percent of the unit
Rock outcrop: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1655E—Sawicki-Clasoil complex, 8 to 35 percent slopes, bouldery, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Sawicki and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, mountain slopes
Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.1 inches

Clasoil and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides
Slope: 8 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Fine-loamy alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.9 inches

Additional Components

Tolbert and similar soils: 6 percent of the unit
Clasoil soils that have slopes of less than 8 percent: 5 percent of the unit
Blaincreek and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1656E—Sawicki-Bielenberg, very stony-Tolbert, very stony, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Sawicki and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, mountain slopes
Slope: 15 to 45 percent
Surface layer texture: Gravelly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.3 inches

Bielenberg and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 40 to 50 inches to bedrock (paralithic); 50 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.2 inches

Tolbert and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 15 to 45 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Bielenberg and similar soils: 5 percent of the unit
Clancy and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1657E—Sawicki, very bouldery-Crampton, bouldery-Catgulch, bouldery, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Sawicki and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, mountain slopes
Slope: 15 to 45 percent
Surface layer texture: Very cobbly sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.9 inches

Crampton and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hills, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over sandy and gravelly residuum derived from granite
Gravelly residuum derived from granite
Gravelly slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.5 inches

Catgulch and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 15 to 45 percent
Surface layer texture: Cobbly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Sawicki soils that do not have boulders on the surface: 5 percent of the unit
Burtoner and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1658D—Sawicki, stony-Blaincreek, very stony, complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Sawicki and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, mountain slopes
Slope: 4 to 15 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.3 inches

Blaincreek and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly alluvium over residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from basalt
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.4 inches

Additional Components

Tolbert and similar soils: 4 percent of the unit
Shawmut and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit
Rubble land: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1658E—Sawicki, very stony-Blaincreek, very stony-Tolbert, bouldery, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Sawicki and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.3 inches

Blaincreek and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly alluvium over residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from basalt

Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.4 inches

Tolbert and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Additional Components

Hilger and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Rubble land: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1659E—Sawbuck, stony-Sawbuck, bouldery, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Sawbuck, stony, and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 46 to 60 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt over residuum derived from granite
Gravelly colluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.4 inches

Sawbuck, bouldery, and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 46 to 60 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt over residuum derived from granite
Gravelly colluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.4 inches

Additional Components

Blaincreek and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit
Wickes and similar soils: 3 percent of the unit
Brickner and similar soils: 2 percent of the unit
Gnojek and similar soils: 2 percent of the unit
Shawmut and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1661D—Catgulch-Baxton complex, 2 to 15 percent slopes, stony

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet

Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Catgulch and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 2 to 15 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Baxton and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Sandy colluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Additional Components

Burtoner and similar soils: 5 percent of the unit
Bielenberg and similar soils: 4 percent of the unit
Breeton and similar soils: 3 percent of the unit
Farnuf and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1661E—Catgulch-Baxton complex, 15 to 35 percent slopes, stony

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Catgulch and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 15 to 35 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Baxton and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Sandy colluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Additional Components

Burtoner and similar soils: 6 percent of the unit
Bielenberg and similar soils: 4 percent of the unit

Farnuf and similar soils: 3 percent of the unit
Clancy and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1662D—Catgulch, very stony-Rock outcrop-Burtoner complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Catgulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 4 to 15 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Burtoner and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy alluvium over residuum derived from granite
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.2 inches

Additional Components

Baxton and similar soils: 7 percent of the unit
Connieo and similar soils: 6 percent of the unit
Ashbray and similar soils: 5 percent of the unit
Connieo, bouldery, and similar soils: 3 percent of the unit
Bielenberg and similar soils: 2 percent of the unit
Crackerville and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1663D—Catgulch, bouldery-Burtoner, bouldery-Rock outcrop complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Catgulch and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 2 to 15 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Burtoner and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Fine-loamy alluvium over residuum derived from granite
- Fine-loamy colluvium over residuum derived from granite
- Fine-loamy residuum derived from granite

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Baxton and similar soils: 7 percent of the unit
Connieo, very bouldery, and similar soils: 6 percent of the unit
Breeton and similar soils: 4 percent of the unit
Connieo and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1664E—Catgulch, bouldery-Rock outcrop-Ashbray, bouldery, complex, 4 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Catgulch and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 4 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Ashbray and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 35 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.0 inch

Additional Components

Connieo, very bouldery, and similar soils: 3 percent of the unit
Shaboom and similar soils: 3 percent of the unit
Baxton and similar soils: 2 percent of the unit
Connieo and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1665F—Catgulch, very bouldery-Rock outcrop-Connieo, very stony, complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Catgulch and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 35 to 60 percent
Surface layer texture: Very cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.8 inch

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Connieo and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.5 inches

Additional Components

Baxton and similar soils: 6 percent of the unit
Kounter and similar soils: 5 percent of the unit
Crackerville and similar soils: 4 percent of the unit
Breeton and similar soils: 3 percent of the unit
Shaboom and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1667E—Catgulch, extremely bouldery-Baxton, extremely bouldery-Burtoner, bouldery, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Catgulch and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 3 to 15 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Baxton and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 3 to 15 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Coarse-loamy residuum derived from granite

Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Sandy colluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Burtoner and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy alluvium over residuum derived from granite
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Additional Components

Connieo and similar soils: 6 percent of the unit
Burtoner soils that have slopes of less than 15 percent: 4 percent of the unit
Clancy and similar soils: 3 percent of the unit
Shaboom and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1671E—Tolbert-Blaincreek complex, 8 to 35 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 3,600 to 6,200 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Tolbert and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 8 to 35 percent
Surface layer texture: Cobbly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Blaincreek and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 25 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly alluvium over residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from basalt
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.6 inches

Additional Components

Wickes and similar soils: 10 percent of the unit
Shawmut and similar soils: 6 percent of the unit
Rock outcrop: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1672E—Tolbert-Blaincreek complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Tolbert and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 8 to 35 percent
Surface layer texture: Cobbly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Blaincreek and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 25 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly alluvium over residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from basalt
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.6 inches

Additional Components

Sawicki and similar soils: 6 percent of the unit
Perma and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Wickes and similar soils: 3 percent of the unit
Gnojek and similar soils: 2 percent of the unit
Rubble land: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1675E—Tolbert, very stony-Blaincreek, stony-Rock outcrop complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Tolbert and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Blaincreek and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly alluvium over residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from basalt
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 2.6 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Additional Components

Sawicki and similar soils: 6 percent of the unit
Gnojek and similar soils: 5 percent of the unit
Wickes and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1675F—Tolbert, very stony-Rock outcrop-Blaincreek, very stony, complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 105 days

Component Description

Tolbert and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Blaincreek and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 45 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly alluvium over residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from basalt
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.6 inches

Additional Components

Sawicki and similar soils: 7 percent of the unit
Perma and similar soils: 6 percent of the unit
Brickner and similar soils: 5 percent of the unit
Gnojek and similar soils: 3 percent of the unit
Libeg and similar soils: 2 percent of the unit
Wickes and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1680D—Raynesford silt loam, 4 to 15 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Raynesford and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Alluvial fans, drainageways, swales
Slope: 4 to 15 percent

Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from limestone
Fine-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.1 inches

Additional Components

Hanson and similar soils: 3 percent of the unit
Raynesford soils that have slopes of more than 25 percent: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1690F—Cheadle, very stony-Rock outcrop-Tiban, bouldery, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Cheadle and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary and metamorphic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Tiban and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.0 inches

Additional Components

Kimpton and similar soils: 6 percent of the unit
Monaberg and similar soils: 5 percent of the unit
Ratiopeak and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1721C—Martinsdale loam, 2 to 8 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Martinsdale and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite

Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Additional Components

Judell and similar soils: 3 percent of the unit
Martinsdale, cobbly, and similar soils: 3 percent of the unit
Shawmut and similar soils: 2 percent of the unit
Windham and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1722C—Martinsdale-Martinsdale, stony-Shawmut complex, 2 to 8 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Martinsdale and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Cobbly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.1 inches

Martinsdale, stony, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 8 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Shawmut and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 2 to 8 percent
Surface layer texture: Cobbly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.1 inches

Additional Components

Martinsdale, cobbly, and similar soils: 7 percent of the unit
Shawmut, stony, and similar soils: 6 percent of the unit
Judell and similar soils: 5 percent of the unit
Windham and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1722E—Martinsdale-Martinsdale, stony-Shawmut complex, 15 to 35 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,200 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Martinsdale and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Cobbly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.1 inches

Martinsdale, stony, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Shawmut and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 15 to 35 percent
Surface layer texture: Cobbly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.1 inches

Additional Components

Absarook and similar soils: 2 percent of the unit
Judell and similar soils: 2 percent of the unit
Martinsdale soils that have slopes of less than 15 percent: 2 percent of the unit
Shawmut, stony, and similar soils: 2 percent of the unit
Windham and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1723D—Martinsdale-Shawmut complex, 2 to 15 percent slopes, bouldery, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Martinsdale and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 2 to 15 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Shawmut and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 2 to 15 percent

Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Additional Components

Martinsdale, stony, and similar soils: 5 percent of the unit
Shawmut soils that have slopes of more than 15 percent: 4 percent of the unit
Martinsdale soils that are not bouldery: 3 percent of the unit
Shawmut soils that are not bouldery: 2 percent of the unit
Judell and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1724D—Martinsdale-Shawmut, stony-Martinsdale, bouldery, complex, 4 to 25 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,200 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Martinsdale and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Cobbly clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.0 inches

Shawmut and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 4 to 25 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Martinsdale, bouldery, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 25 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Additional Components

Absarook and similar soils: 6 percent of the unit
Judell and similar soils: 5 percent of the unit
Windham and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1731E—Tepecreek, bouldery-Caseypeak, very bouldery-Rock outcrop complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Mountains

Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tepecreek and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 8 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly colluvium over residuum derived from granite
- Gravelly slope alluvium over residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.7 inches

Caseypeak and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Very cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Loamy and gravelly slope alluvium over residuum derived from granite
- Sandy and gravelly residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.0 inch

Rock outcrop

Extent: 8 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock.

Additional Components

Rubble land: 7 percent of the unit
Bobowic and similar soils: 3 percent of the unit
Worock and similar soils: 3 percent of the unit
Elve and similar soils: 2 percent of the unit
Franconi and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1731F—Tepecreek, very bouldery-Caseypeak, rubbly-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tepecreek and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 35 to 60 percent
Surface layer texture: Cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly colluvium over residuum derived from granite
- Gravelly slope alluvium over residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.4 inches

Caseypeak and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very stony coarse sandy loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Loamy and gravelly slope alluvium over residuum derived from granite
- Sandy and gravelly residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.0 inch

Rock outcrop

Extent: 9 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock.

Additional Components

Rubble land: 9 percent of the unit
Bobowic and similar soils: 4 percent of the unit
Worock and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1732F—Tepecreek, very bouldery-Caseypeak, very bouldery-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 30 inches
Frost-free period: 30 to 70 days

Component Description

Tepecreek and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 35 to 60 percent
Surface layer texture: Cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from granite
Gravelly slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.4 inches

Caseypeak and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy and gravelly slope alluvium over residuum derived from granite
Sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.0 inch

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock.

Additional Components

Rubble land: 10 percent of the unit
Bobowic and similar soils: 6 percent of the unit
Rubick and similar soils: 5 percent of the unit
Kurrie and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1734F—Hiore, stony-Kurrie, stony-Caseypeak, very stony, complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Hiore and similar soils

Extent: 50 percent of the map unit

Geomorphic position: Mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Sandy and gravelly residuum derived from granite
Sandy and gravelly slope alluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.3 inches

Kurrie and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges
Slope: 35 to 60 percent
Surface layer texture: Cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from granite
Gravelly slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.9 inches

Caseypeak and similar soils

Extent: 10 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy and gravelly slope alluvium over residuum derived from granite
Sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.0 inch

Additional Components

Hiore soils that have slopes of less than 35 percent: 6 percent of the unit
Hiore, cool, and similar soils: 5 percent of the unit
Rock outcrop: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1735E—Tepecreek, stony-Caseypeak, very bouldery-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tepecreek and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from granite
Gravelly slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.5 inches

Caseypeak and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)

Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy and gravelly slope alluvium over residuum derived from granite
Sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.0 inch

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Branham and similar soils: 5 percent of the unit
Tepecreek soils that have slopes of more than 35 percent: 5 percent of the unit
Tuggle and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1735F—Tepecreek, stony-Caseypeak, very stony-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tepecreek and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 35 to 60 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from granite
Gravelly slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.5 inches

Caseypeak and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Cobbly loamy coarse sand
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy and gravelly slope alluvium over residuum derived from granite
Sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Tepecreek soils that have slopes of less than 35 percent: 10 percent of the unit
Tuggle and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1740E—Tropal, bouldery-Hanson, stony-Rock outcrop complex, 8 to 25 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tropal and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 8 to 25 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Hanson and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.5 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of areas of exposed hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Tropal, very stony, and similar soils: 6 percent of the unit
Firada and similar soils: 5 percent of the unit
Whitore and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1741F—Tropal, bouldery-Rock outcrop-Whitore, bouldery, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tropal and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Whitore and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.0 inches

Additional Components

Firada and similar soils: 6 percent of the unit
Hanson and similar soils: 5 percent of the unit
Helmville and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1742F—Tropal, very bouldery-Rock outcrop complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tropal and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Hanson and similar soils: 4 percent of the unit
Firada and similar soils: 3 percent of the unit
Whitore and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1750F—Whitore, bouldery-Tropal, very bouldery-Rock outcrop complex, 25 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Whitore and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 25 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.0 inches

Tropal and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 25 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Rock outcrop

Extent: 20 percent of the map unit

Definition: This component consists mainly of exposed areas of hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Firada and similar soils: 6 percent of the unit
Helmville and similar soils: 5 percent of the unit
Hanson and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1751F—Whitore, very stony-Tropal, very bouldery-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Whitore and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.5 inches

Tropal and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Firada and similar soils: 6 percent of the unit
Helmville and similar soils: 5 percent of the unit
Hanson and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1752E—Whitore, stony-Helmville, bouldery-Firada, very stony, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Whitore and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.3 inches

Helmville and similar soils

Extent: 25 percent of the map unit

Geomorphic position: Mountain slopes, mountain valleys
Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from argillaceous limestone
Gravelly slope alluvium derived from argillaceous limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.6 inches

Firada and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over gravelly residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.1 inches

Additional Components

Tropal and similar soils: 6 percent of the unit
Rock outcrop: 5 percent of the unit
Hanson and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1753E—Whitore, stony-Tropal, very stony-Firada, very stony, complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Whitore and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 8 to 35 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.3 inches

Tropal and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 8 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Firada and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over gravelly residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over gravelly residuum derived from limestone
Native plant cover type: Forest land

Flooding: None
Sodicity: Sodic within a depth of 30 inches
Available water capacity: Mainly 3.1 inches

Additional Components

Helmville and similar soils: 4 percent of the unit
Hanson and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1760E—Hanson, stony-Whitore, bouldery, complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Hanson and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges
Slope: 8 to 35 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.5 inches

Whitore and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.0 inches

Additional Components

Tropal and similar soils: 10 percent of the unit
Rock outcrop: 4 percent of the unit
Firada and similar soils: 3 percent of the unit
Helmville and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1770E—Helmville, rubbly-Tiban, very bouldery-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Helmville and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Mountain slopes, mountain valleys
Slope: 15 to 45 percent
Surface layer texture: Stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from argillaceous limestone
Gravelly slope alluvium derived from argillaceous limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 6.5 inches

Tiban and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted

Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Rubble land: 10 percent of the unit
Kimpton and similar soils: 3 percent of the unit
Redfern and similar soils: 3 percent of the unit
Cheadle and similar soils: 2 percent of the unit
Nieman and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1781E—Firada, stony-Tropal, very stony-Rock outcrop complex, 4 to 25 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Firada and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over gravelly residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.2 inches

Tropal and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 4 to 25 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Hanson and similar soils: 6 percent of the unit
Whitore and similar soils: 5 percent of the unit
Tiban and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1790F—Sigbird, very bouldery-Sigbird, stony-Rock outcrop complex, 25 to 70 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Sigbird, very bouldery, and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges

Slope: 35 to 70 percent
Surface layer texture: Very channery loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Gravelly residuum derived from claystone
Gravelly slope alluvium derived from hard shale over residuum derived from hard shale
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Sigbird, stony, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 25 to 50 percent
Surface layer texture: Channery loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Gravelly residuum derived from claystone
Gravelly slope alluvium derived from hard shale over residuum derived from hard shale
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.4 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured shale bedrock. Flagstones litter the areas and accumulate at the base of hills and escarpments.

Additional Components

Hanson and similar soils: 4 percent of the unit
Cheadle and similar soils: 3 percent of the unit
Kimpton and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1800D—Breeton coarse sandy loam, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Breeton and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium derived from granite
Coarse-loamy colluvium derived from granite
Coarse-loamy slope alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.4 inches

Additional Components

Baxton and similar soils: 6 percent of the unit
Connieo and similar soils: 4 percent of the unit
Burtoner and similar soils: 3 percent of the unit
Catgulch and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1802D—Breeton-Baxton-Connieo complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Breeton and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces

Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium derived from granite
Coarse-loamy colluvium derived from granite
Coarse-loamy slope alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.4 inches

Baxton and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hillsides, mountainsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Sandy colluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Connieo and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Additional Components

Baxton, bouldery, and similar soils: 6 percent of the unit
Rock outcrop: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1803C—Breeton-Cometcrik complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, river valleys, valleys, uplands
Elevation: 3,940 to 6,000 feet
Mean annual precipitation: 12 to 22 inches
Frost-free period: 80 to 105 days

Component Description

Breeton and similar soils

Extent: 65 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 8 percent
Surface layer texture: Coarse sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium derived from granite
Coarse-loamy colluvium derived from granite
Coarse-loamy slope alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.4 inches

Cometcrik and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 2 to 4 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Poorly drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Frequent
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.4 inches

Additional Components

Eagleton and similar soils: 4 percent of the unit
Kokoruda and similar soils: 4 percent of the unit
Faith and similar soils: 3 percent of the unit
Wetsand and similar soils: 3 percent of the unit
Perma and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1810F—Hoyt, very stony-Ymark, bouldery-Shaboom, very bouldery, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Hoyt and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides
Slope: 25 to 60 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from basalt
Fine-loamy slope alluvium derived from basalt
Fine-loamy till
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 9.0 inches

Ymark and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly colluvium derived from granite and fine grained igneous rock over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.9 inches

Shaboom and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Cobbly sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Lumpgulch and similar soils: 5 percent of the unit
Breeton and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Repkie and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1821F—Kellygulch, bouldery-Rock outcrop-Bielenberg complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Kellygulch and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over residuum derived from granite
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.1 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Bielenberg and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Loam
Depth to restrictive feature: 40 to 50 inches to bedrock (paralithic); 50 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Elmark and similar soils: 4 percent of the unit
Baxton and similar soils: 2 percent of the unit
Lumpgulch and similar soils: 2 percent of the unit
Shaboom and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1822F—Kellygulch, stony-Shaboom, very bouldery-Rock outcrop association, 45 to 75 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Kellygulch and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 45 to 75 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over residuum derived from granite
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.9 inches

Shaboom and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 45 to 75 percent
Surface layer texture: Cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock.

Additional Components

Rubble land: 10 percent of the unit
Baxton, moist, and similar soils: 5 percent of the unit
Baxton soils that have slopes of less than 35 percent: 5 percent of the unit
Shaboom, extremely bouldery, and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1823E—Kellygulch, stony-Shaboom, very bouldery-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Kellygulch and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over residuum derived from granite
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.1 inches

Shaboom and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Baxton and similar soils: 5 percent of the unit
Breeton and similar soils: 3 percent of the unit
Kellygulch soils that have slopes of more than 35 percent: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1823F—Kellygulch, stony-Shaboom, very bouldery-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Kellygulch and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over residuum derived from granite
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.1 inches

Shaboom and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Coarse sandy loam

Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Baxton and similar soils: 5 percent of the unit
Kellygulch soils that have slopes of less than 35 percent: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1830E—Clancy-Bielenberg-Breeton complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Clancy and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hills, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Fine-loamy colluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.8 inches

Bielenberg and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Loam
Depth to restrictive feature: 40 to 50 inches to bedrock (paralithic); 50 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Breeton and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium derived from granite
Coarse-loamy colluvium derived from granite
Coarse-loamy slope alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.4 inches

Additional Components

Catgulch and similar soils: 6 percent of the unit
Connieo and similar soils: 5 percent of the unit
Burtoner and similar soils: 4 percent of the unit
Shaboom and similar soils: 4 percent of the unit
Kellygulch and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1831D—Clancy-Burtoner, bouldery, complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 95 days

Component Description

Clancy and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hills, ridges
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Fine-loamy colluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.8 inches

Burtoner and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Fine-loamy alluvium over residuum derived from granite
- Fine-loamy colluvium over residuum derived from granite
- Fine-loamy residuum derived from granite

Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Additional Components

Farnuf and similar soils: 4 percent of the unit
Catgulch and similar soils: 3 percent of the unit
Martinsdale and similar soils: 3 percent of the unit
Baxton and similar soils: 2 percent of the unit
Placerton and similar soils: 2 percent of the unit
Hapgood and similar soils: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1832D—Clancy-Burtoner, bouldery-Rock outcrop complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Clancy and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hills, ridges
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Fine-loamy colluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.8 inches

Burtoner and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Fine-loamy alluvium over residuum derived from granite
- Fine-loamy colluvium over residuum derived from granite
- Fine-loamy residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.2 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Farnuf and similar soils: 6 percent of the unit
Martinsdale and similar soils: 5 percent of the unit
Catgulch and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1833D—Clancy-Connieo complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Clancy and similar soils

Extent: 70 percent of the map unit
Geomorphic position: Escarpments, hills, ridges
Slope: 2 to 15 percent
Surface layer texture: Loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Fine-loamy colluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Connieo and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Additional Components

Placerton and similar soils: 6 percent of the unit
Bielenberg and similar soils: 4 percent of the unit
Crackerville and similar soils: 3 percent of the unit
Martinsdale and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1835D—Clancy-Bielenberg-Connieo complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Clancy and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hills, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Fine-loamy colluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.2 inches

Bielenberg and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 4 to 8 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 40 to 50 inches to bedrock (paralithic); 50 to 60 inches to bedrock (lithic)
Drainage class: Well drained

Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Connieo and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.1 inches

Additional Components

Burtoner and similar soils: 5 percent of the unit
Connieo soils that have slopes of more than 15 percent: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1836E—Clancy, bouldery-Bielenberg, stony-Catgulch, bouldery, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Clancy and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hills, ridges
Slope: 15 to 45 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Fine-loamy colluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.5 inches

Bielenberg and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 40 to 50 inches to bedrock (paralithic); 50 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.2 inches

Catgulch and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 15 to 45 percent
Surface layer texture: Cobbly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Burtoner and similar soils: 4 percent of the unit
Crampton and similar soils: 4 percent of the unit
Placerton and similar soils: 3 percent of the unit
Bielenberg soils that have slopes of less than 15 percent: 2 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1837E—Clancy-Bielenberg-Connieo complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Clancy and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hills, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Fine-loamy colluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.2 inches

Bielenberg and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 40 to 50 inches to bedrock (paralithic); 50 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Connieo and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly sandy clay loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.1 inches

Additional Components

Burtoner and similar soils: 4 percent of the unit
Baxton and similar soils: 3 percent of the unit
Farnuf and similar soils: 2 percent of the unit
Rock outcrop: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1838D—Clancy-Clancy, very stony-Bielenberg complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Clancy and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hills, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Fine-loamy colluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.2 inches

Clancy, very stony, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hills, ridges
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)

Drainage class: Well drained
Parent material: Fine-loamy colluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.8 inches

Bielenberg and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 40 to 50 inches to bedrock (paralithic); 50 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Burtoner and similar soils: 5 percent of the unit
Connieo and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1841D—Tuggle-Branham-Rock outcrop complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tuggle and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 2 to 15 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from granite
Loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.7 inches

Branham and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 2 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Sandy and gravelly residuum derived from granite
Sandy and gravelly colluvium over residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Opitz and similar soils: 6 percent of the unit
Branham, moist, and similar soils: 5 percent of the unit
Caseypeak and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1842D—Caseypeak-Branham-Rock outcrop complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Caseypeak and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Loamy and gravelly slope alluvium over residuum derived from granite
- Sandy and gravelly residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Branham and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 2 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Sandy and gravelly residuum derived from granite
- Sandy and gravelly colluvium over residuum derived from granite
- Coarse-loamy slope alluvium over residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.9 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Bobowic and similar soils: 5 percent of the unit
Clugulch and similar soils: 4 percent of the unit
Branham, moist, and similar soils: 3 percent of the unit
Lowder and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1842E—Caseypeak-Branham-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Caseypeak and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Loamy and gravelly slope alluvium over residuum derived from granite
- Sandy and gravelly residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Branham and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Sandy and gravelly residuum derived from granite
- Sandy and gravelly colluvium over residuum derived from granite
- Coarse-loamy slope alluvium over residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.9 inches

Rock outcrop

Extent: 15 percent of the map unit

Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Bobowic and similar soils: 5 percent of the unit
Clugulch and similar soils: 4 percent of the unit
Tepecreek and similar soils: 3 percent of the unit
Branham, moist, and similar soils: 2 percent of the unit
Lowder and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1842F—Caseypeak, bouldery-Branham, bouldery-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 40 to 70 days

Component Description

Caseypeak and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy and gravelly slope alluvium over residuum derived from granite
Sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Branham and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 35 to 60 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Sandy and gravelly residuum derived from granite
Sandy and gravelly colluvium over residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.9 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Clugulch and similar soils: 5 percent of the unit
Bobowic and similar soils: 4 percent of the unit
Tepecreek and similar soils: 3 percent of the unit
Branham loam and similar soils: 2 percent of the unit
Lowder and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1851D—Branham-Lowder loams, 0 to 8 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Branham and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 0 to 8 percent
Surface layer texture: Loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy residuum derived from granite

Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.2 inches

Lowder and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, drainageways, flood plains, flood-plain steps
Slope: 0 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Fine-loamy over sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Forest land
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.2 inches

Additional Components

Branham, very bouldery, and similar soils: 6 percent of the unit
Opitz and similar soils: 5 percent of the unit
Clugulch and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1851E—Branham-Lowder loams, 8 to 25 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Branham and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 8 to 25 percent
Surface layer texture: Loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.2 inches

Lowder and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, drainageways, flood plains, flood-plain steps
Slope: 8 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Fine-loamy over sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Forest land
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.2 inches

Additional Components

Branham, very bouldery, and similar soils: 6 percent of the unit
Opitz and similar soils: 5 percent of the unit
Clugulch and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1853D—Branham-Tuggle complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Branham and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 2 to 15 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained

Parent material:
Sandy and gravelly residuum derived from granite
Sandy and gravelly colluvium over residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Tuggle and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 2 to 15 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from granite
Loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.7 inches

Additional Components

Opitz and similar soils: 5 percent of the unit
Clugulch and similar soils: 4 percent of the unit
Branham loam and similar soils: 3 percent of the unit
Lowder and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1853E—Branham-Tuggle complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Branham and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Sandy and gravelly residuum derived from granite
Sandy and gravelly colluvium over residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.4 inches

Tuggle and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from granite
Loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.7 inches

Additional Components

Opitz and similar soils: 5 percent of the unit
Hiore and similar soils: 4 percent of the unit
Branham, moist, and similar soils: 3 percent of the unit
Clugulch and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1861F—Clugulch-Bobowic-Rock outcrop complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Mountains, foothills
Elevation: 4,400 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 40 to 95 days

Component Description

Clugulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 4 to 10 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.7 inch

Bobowic and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 35 to 70 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Sandy and gravelly alluvium over residuum derived from granite
- Sandy and gravelly colluvium over residuum derived from granite
- Sandy and gravelly residuum derived from granite
- Sandy and gravelly slope alluvium over residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Caseypeak and similar soils: 6 percent of the unit
Elmark and similar soils: 5 percent of the unit
Lumpgulch and similar soils: 5 percent of the unit
Hiore and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1871E—Hiore, stony-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Hiore and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Mountain slopes, mountain valleys
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
- Sandy and gravelly residuum derived from granite
- Sandy and gravelly slope alluvium derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.3 inches

Rock outcrop

Extent: 35 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Bobowic and similar soils: 5 percent of the unit
Tepecreek and similar soils: 4 percent of the unit
Branham and similar soils: 3 percent of the unit
Kurrie and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1871F—Hiore, stony-Rock outcrop complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Mountains, foothills
Elevation: 4,500 to 7,500 feet

Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 95 days

Component Description

Hiore and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Mountain slopes, mountain valleys
Slope: 35 to 70 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Sandy and gravelly residuum derived from granite
Sandy and gravelly slope alluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.3 inches

Rock outcrop

Extent: 35 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Bobowic and similar soils: 5 percent of the unit
Kellygulch and similar soils: 4 percent of the unit
Caseypeak and similar soils: 3 percent of the unit
Kurrie and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1872E—Hiore-Clugulch-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Hiore and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Mountain slopes, mountain valleys
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Sandy and gravelly residuum derived from granite
Sandy and gravelly slope alluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.3 inches

Clugulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 4 to 10 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.7 inch

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Branham and similar soils: 5 percent of the unit
Clugulch soils that have slopes of more than 35 percent: 5 percent of the unit
Tepecreek and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1872F—Hiore-Clugulch-Rock outcrop complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Hiore and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Mountain slopes, mountain valleys
Slope: 35 to 70 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Sandy and gravelly residuum derived from granite
Sandy and gravelly slope alluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.3 inches

Clugulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Sandy loam
Depth to restrictive feature: 4 to 10 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.7 inch

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Caseypeak and similar soils: 5 percent of the unit
Hiore soils that have slopes of less than 35 percent: 5 percent of the unit
Tepecreek and similar soils: 5 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1901F—Warwood-Tigeron, very stony-Cowood, very stony, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Warwood and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 25 to 60 percent
Surface layer texture: Gravelly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 8.1 inches

Tigeron and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges, saddles
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.0 inches

Cowood and similar soils

Extent: 15 percent of the map unit

Geomorphic position: Escarpments, mountainsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Extremely cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Rock outcrop: 7 percent of the unit
Tigeron, bouldery, and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1902D—Warwood, very bouldery-Warwood, very stony-Tigeron, very bouldery, complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Warwood, very bouldery, and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 2 to 15 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 7.6 inches

Warwood, very stony, and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 2 to 15 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 7.6 inches

Tigeron and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges, saddles
Slope: 2 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.0 inches

Additional Components

Redfern and similar soils: 7 percent of the unit
Tigeron soils that have slopes of more than 15 percent: 5 percent of the unit
Ellena and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1910F—Elmark, very bouldery-Rock outcrop-Shaboom, extremely bouldery, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Elmark and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountainsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over sandy and gravelly residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.6 inches

Rock outcrop

Extent: 35 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Shaboom and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 3 to 15 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Ashbray and similar soils: 4 percent of the unit
Breeton and similar soils: 3 percent of the unit
Kellygulch and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1921D—Judell-Lap, very stony, complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Judell and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from limestone
Fine-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.3 inches

Lap and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 15 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained

Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Judell soils that have slopes of more than 15 percent: 3 percent of the unit
Maiden and similar soils: 3 percent of the unit
Windham and similar soils: 3 percent of the unit
Rock outcrop: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1921E—Judell-Lap, very stony, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Judell and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from limestone
Fine-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.3 inches

Lap and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Judell soils that have slopes of less than 15 percent: 6 percent of the unit
Maiden and similar soils: 4 percent of the unit
Windham and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1930E—Elmark-Kellygulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Mountains, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Elmark and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountainsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over sandy and gravelly residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.0 inches

Kellygulch and similar soils

Extent: 30 percent of the map unit

Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over residuum derived from granite
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.0 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Kellygulch soils that have slopes of more than 35 percent: 7 percent of the unit
Shaboom and similar soils: 5 percent of the unit
Hoyt and similar soils: 4 percent of the unit
Lumpgulch and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1933E—Elmark, bouldery-Breeton-Shaboom, bouldery, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Elmark and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountainsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over sandy and gravelly residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.7 inches

Breeton and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 45 percent
Surface layer texture: Coarse sandy loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium derived from granite
Coarse-loamy colluvium derived from granite
Coarse-loamy slope alluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 6.4 inches

Shaboom and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Cobbly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Hoyt and similar soils: 5 percent of the unit
Kellygulch and similar soils: 5 percent of the unit
Lumpgulch and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1940E—Elmark, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Mountains, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Elmark and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountainsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over sandy and gravelly residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.0 inches

Lumpgulch and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.4 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Kellygulch and similar soils: 6 percent of the unit
Hoyt and similar soils: 5 percent of the unit
Shaboom and similar soils: 5 percent of the unit
Bignell and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1945E—Elmark, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes, dry

Map Unit Setting

Landscape: Mountains, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Elmark and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountainsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained

Parent material:
Fine-loamy colluvium over sandy and gravelly residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.0 inches

Lumpgulch and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.4 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Elmark, gravelly, and similar soils: 6 percent of the unit
Kellygulch and similar soils: 5 percent of the unit
Shaboom and similar soils: 5 percent of the unit
Hoyt and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1946E—Elmark, bouldery-Hoyt-Shaboom, very bouldery, complex, 8 to 35 percent slopes, dry

Map Unit Setting

Landscape: Mountains, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Elmark and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountainsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over sandy and gravelly residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.0 inches

Hoyt and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, hillsides
Slope: 8 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from basalt
Fine-loamy slope alluvium derived from basalt
Fine-loamy till
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 9.1 inches

Shaboom and similar soils

Extent: 20 percent of the map unit

Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Elmark, very bouldery, and similar soils: 5 percent of the unit
Lumpgulch and similar soils: 5 percent of the unit
Kellygulch and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1947E—Elmark, bouldery-Burtoner-Rock outcrop complex, 8 to 45 percent slopes

Map Unit Setting

Landscape: Mountains, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 70 to 105 days

Component Description

Elmark and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountainsides, ridges
Slope: 8 to 45 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over sandy and gravelly residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.5 inches

Burtoner and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 45 percent
Surface layer texture: Sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy alluvium over residuum derived from granite
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.6 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Clancy and similar soils: 5 percent of the unit
Shaboom and similar soils: 4 percent of the unit
Baxton and similar soils: 3 percent of the unit
Hoyt and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1948E—Elmark, very bouldery-Skyview, very bouldery-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains, foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Elmark and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountainsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over sandy and gravelly residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.3 inches

Skyview and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Colluvium derived from granite over residuum derived from granite
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.0 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Hoyt and similar soils: 5 percent of the unit
Shaboom and similar soils: 5 percent of the unit
Skyview, gravelly, and similar soils: 5 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1950F—Franconi, very bouldery-Warwood-Caseypeak, very bouldery, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Franconi and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.0 inches

Warwood and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 25 to 60 percent
Surface layer texture: Gravelly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 8.1 inches

Caseypeak and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Very gravelly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy and gravelly slope alluvium over residuum derived from granite
Sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.0 inch

Additional Components

Rock outcrop: 5 percent of the unit
Releep and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1960D—Lumpgulch, bouldery-Hoyt-Shaboom, very bouldery, complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Lumpgulch and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Flooding: None
Available water capacity: Mainly 3.4 inches

Hoyt and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides
Slope: 4 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from basalt
Fine-loamy slope alluvium derived from basalt
Fine-loamy till
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 9.1 inches

Shaboom and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Additional Components

Elmark and similar soils: 6 percent of the unit
Kellygulch and similar soils: 5 percent of the unit
Rock outcrop: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1961E—Lumpgulch, bouldery-Hoyt-Shaboom, very bouldery, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, mountains

Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Lumpgulch and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.4 inches

Hoyt and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, hillsides
Slope: 15 to 45 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from basalt
Fine-loamy slope alluvium derived from basalt
Fine-loamy till
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 9.1 inches

Shaboom and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Cobbly sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Elmark and similar soils: 4 percent of the unit
Hoyt soils that have slopes of less than 15 percent: 3 percent of the unit
Kellygulch and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit
Bignell and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1962E—Lumpgulch, bouldery-Yreka, very bouldery-Shaboom, very bouldery, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Lumpgulch and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.4 inches

Yreka and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Cobbly loam

Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly colluvium derived from mixed, fine grained igneous, sedimentary, and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 7.1 inches

Shaboom and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Cobbly sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Hoyt and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1963F—Lumpgulch, very bouldery-Rock outcrop-Kellygulch, very bouldery, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Lumpgulch and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.4 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Kellygulch and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over residuum derived from granite
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.0 inches

Additional Components

Shaboom and similar soils: 6 percent of the unit
Hoyt and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1964E—Lumpgulch, very bouldery-Shaboom, very bouldery-Rock outcrop complex, 8 to 25 percent slopes

Map Unit Setting

Landscape: Foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Lumpgulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 25 percent
Surface layer texture: Sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.4 inches

Shaboom and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 25 percent
Surface layer texture: Cobbly sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Kellygulch and similar soils: 6 percent of the unit
Hoyt and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1965E—Lumpgulch, bouldery-Ymark, very bouldery-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Lumpgulch and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from granite over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.8 inches

Ymark and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, mountain slopes, ridges
Slope: 15 to 45 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)

Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly colluvium derived from granite and fine grained igneous rock over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.9 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Shaboom and similar soils: 6 percent of the unit
Kellygulch and similar soils: 5 percent of the unit
Hoyt and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1970E—Bignell, stony-Yreka, very stony, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 105 days

Component Description

Bignell and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, hillsides
Slope: 15 to 35 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Clayey colluvium
Clayey slope alluvium
Clayey till
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.1 inches

Yreka and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly colluvium derived from mixed, fine grained igneous, sedimentary, and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 7.0 inches

Additional Components

Yreka, stony, and similar soils: 5 percent
Brickner and similar soils: 3 percent
Hoyt and similar soils: 3 percent
Skyview and similar soils: 2 percent
Stemple and similar soils: 2 percent

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

1980F—Stemple cobbly loam, 35 to 60 percent slopes, very stony

Map Unit Setting

Landscape: Mountains, foothills
Elevation: 4,400 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 105 days

Component Description

Stemple and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Escarpments, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from claystone
Native plant cover type: Forest land

Flooding: None
Available water capacity: Mainly 3.9 inches

Additional Components

Cowood and similar soils: 4 percent of the unit
Tigeron and similar soils: 4 percent of the unit
Bignell and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1990F—Bobowic, very bouldery-Rock outcrop-Tepecreek, very bouldery, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Bobowic and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Sandy and gravelly alluvium over residuum derived from granite
- Sandy and gravelly colluvium over residuum derived from granite
- Sandy and gravelly residuum derived from granite
- Sandy and gravelly slope alluvium over residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.8 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Tepecreek and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Very gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly colluvium over residuum derived from granite
- Gravelly slope alluvium over residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.6 inches

Additional Components

Caseypeak and similar soils: 5 percent of the unit
Peeler and similar soils: 5 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

1991D—Bobowic-Clugulch, bouldery-Rock outcrop complex, 4 to 25 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Bobowic and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 4 to 15 percent
Surface layer texture: Gravelly coarse sandy loam
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Sandy and gravelly alluvium over residuum derived from granite
- Sandy and gravelly colluvium over residuum derived from granite
- Sandy and gravelly residuum derived from granite

Sandy and gravelly slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.8 inches

Clugulch and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 8 to 25 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 4 to 10 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.6 inch

Rock outcrop

Extent: 8 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock.

Additional Components

Rubble land: 7 percent of the unit
Branham and similar soils: 6 percent of the unit
Opitz and similar soils: 5 percent of the unit
Caseypeak and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2000E—Skyview, very bouldery-Rock outcrop-Roegulch, very bouldery, complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Skyview and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Colluvium derived from granite over residuum derived from granite
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.3 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Roegulch and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Cobbly sandy clay loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Additional Components

Elmark and similar soils: 4 percent of the unit
Skyview soils that have slopes of more than 35 percent: 4 percent of the unit
Repkie and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2001E—Skyview, very bouldery-Elmark, very bouldery-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Skyview and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Very cobbly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Colluvium derived from granite over residuum derived from granite
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.0 inches

Elmark and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountainsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over sandy and gravelly residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.5 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Shaboom and similar soils: 5 percent of the unit
Hoyt and similar soils: 4 percent of the unit
Ymark and similar soils: 4 percent of the unit
Repkie and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2011D—Shawmut gravelly loam, 4 to 15 percent slopes, bouldery, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Shawmut and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Additional Components

Shawmut soils that have slopes of more than 15 percent: 8 percent of the unit
Martinsdale and similar soils: 7 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2012D—Shawmut, stony-Martinsdale, very stony, complex, 4 to 15 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Shawmut and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 4 to 15 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Martinsdale and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 4 to 15 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.1 inches

Additional Components

Shawmut soils that have slopes of more than 15 percent: 6 percent of the unit
Martinsdale loam and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2012E—Shawmut, stony-Martinsdale, very stony, complex, 15 to 25 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Shawmut and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 15 to 25 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Martinsdale and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 15 to 25 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, fine-loamy alluvium derived from granite
Calcareous, fine-loamy slope alluvium derived

from fine grained sandstone, siltstone, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.1 inches

Additional Components

Wimper and similar soils: 6 percent of the unit
Martinsdale soils that have slopes of less than 15 percent: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2013E—Shawmut, bouldery-Wickes, stony-Tolbert, bouldery, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Shawmut and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.4 inches

Wickes and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt over residuum derived from basalt
Gravelly colluvium over residuum derived from sandstone
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.9 inches

Tolbert and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.0 inch

Additional Components

Wimper and similar soils: 6 percent of the unit
Martinsdale and similar soils: 5 percent of the unit
Rock outcrop: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2014E—Shawmut-Tolbert complex, 8 to 35 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 3,600 to 6,200 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Shawmut and similar soils

Extent: 60 percent of the map unit

Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.0 inches

Tolbert and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 8 to 35 percent
Surface layer texture: Cobbly loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Wimper and similar soils: 6 percent of the unit
Martinsdale and similar soils: 5 percent of the unit
Rock outcrop: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2020D—Shawmut, stony-Shawmut, bouldery, complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Shawmut, stony, and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 4 to 15 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Shawmut, bouldery, and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 4 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.3 inches

Additional Components

Martinsdale and similar soils: 5 percent of the unit
Gnojek and similar soils: 4 percent of the unit
Blaincreek and similar soils: 3 percent of the unit
Wickes and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2030E—Kokoruda-Elmark, very bouldery-Rock outcrop complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, river valleys, valleys
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 22 inches
Frost-free period: 90 to 105 days

Component Description

Kokoruda and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, swales
Slope: 15 to 35 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy alluvium
Fine-loamy slope alluvium
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 7.9 inches

Elmark and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountainsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over sandy and gravelly residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.0 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Eagleton and similar soils: 6 percent of the unit
Lumpgulch and similar soils: 5 percent of the unit
Shaboom and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2031D—Eagleton, stony-Kokoruda-Cometcrik complex, 2 to 25 percent slopes

Map Unit Setting

Landscape: River valleys, valleys, foothills, mountains
Elevation: 3,800 to 6,000 feet
Mean annual precipitation: 10 to 22 inches
Frost-free period: 80 to 115 days

Component Description

Eagleton and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 4 to 15 percent
Surface layer texture: Clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Poorly drained
Parent material: Fine-loamy alluvium
Native plant cover type: Forest land
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.4 inches

Kokoruda and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, swales
Slope: 8 to 25 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy alluvium
Fine-loamy slope alluvium
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 7.9 inches

Cometcrik and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Poorly drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Frequent
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.4 inches

Additional Components

Hoyt and similar soils: 6 percent of the unit
Wetsand and similar soils: 5 percent of the unit
Yreka and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2040F—Shaboom, extremely bouldery-Rock outcrop-Rubble land association, 35 to 70 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Shaboom and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Sandy loam
Percent of surface covered by rock fragments: 3 to 15 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.2 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock.

Rubble land

Extent: 20 percent of the map unit
Definition: This component consists of areas of hard, rounded granite cobbles, stones, and boulders.

Additional Components

Kellygulch and similar soils: 6 percent of the unit
Elmark and similar soils: 5 percent of the unit
Ashbray and similar soils: 4 percent of the unit
Breeton and similar soils: 4 percent of the unit
Burtoner and similar soils: 3 percent of the unit
Sawbuck and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2041F—Rock outcrop-Catgulch, bouldery, complex, 15 to 70 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Rock outcrop

Extent: 60 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Catgulch and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 15 to 70 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Ashbray and similar soils: 6 percent of the unit
Shaboom and similar soils: 5 percent of the unit
Connieo and similar soils: 4 percent of the unit
Crampton and similar soils: 4 percent of the unit
Breeton and similar soils: 3 percent of the unit
Clancy and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2042F—Rock outcrop-Cheadle, very bouldery-Tiban, very bouldery, complex, 15 to 50 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Rock outcrop

Extent: 35 percent of the map unit
Definition: This component consists mainly of exposed areas of hard sedimentary and metamorphic bedrock. Angular cobbles, stones, and boulders litter the areas and accumulate at the base of hills and escarpments.

Cheadle and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 15 to 50 percent
Surface layer texture: Stony loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.5 inches

Tiban and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Helmville and similar soils: 6 percent of the unit
Kimpton and similar soils: 5 percent of the unit
Ratiopeak and similar soils: 5 percent of the unit
Tibkey and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2043F—Rencot, very stony-Rencot, bouldery-Rock outcrop association, 15 to 60 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 115 days

Component Description

Rencot, very stony, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces
Slope: 15 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Rencot, bouldery, and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, hillsides, strath terraces

Slope: 15 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Rubble land: 15 percent of the unit
Bronec and similar soils: 4 percent of the unit
Geohrock and similar soils: 3 percent of the unit
Sieben and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2045F—Caseypeak, very stony-Rock outcrop-Rubble land association, 15 to 60 percent slopes, dry

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Caseypeak and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 15 to 60 percent
Surface layer texture: Very cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy and gravelly slope alluvium over residuum derived from granite
Sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.0 inch

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists of exposures of hard, coarse grained (granite) and fine grained (basalt or rhyolite) bedrock. In granitic areas, a thin layer of decomposing granite (grus) covers the surface.

Rubble land

Extent: 20 percent of the map unit
Definition: This component consists of areas of rounded granite and angular basalt or rhyolite cobbles, stones, and boulders.

Additional Components

Hiore and similar soils: 6 percent of the unit
Peeler and similar soils: 5 percent of the unit
Clugulch and similar soils: 4 percent of the unit
Warwood and similar soils: 4 percent of the unit
Tepecreek and similar soils: 3 percent of the unit
Tuggle and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2046F—Caseypeak, very bouldery-Rock outcrop-Rubble land association, 15 to 60 percent slopes, cool

Map Unit Setting

Landscape: Mountains
Elevation: 6,000 to 8,500 feet
Mean annual precipitation: 20 to 30 inches
Frost-free period: 30 to 60 days

Component Description

Caseypeak and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 15 to 60 percent

Surface layer texture: Very cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy and gravelly slope alluvium over residuum derived from granite
Sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.0 inch

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock.

Rubble land

Extent: 25 percent of the map unit
Definition: This component consists of areas of hard, rounded granite cobbles, stones, and boulders.

Additional Components

Tepecreek and similar soils: 6 percent of the unit
Warwood and similar soils: 5 percent of the unit
Cowood and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2051E—Opitz, bouldery-Branham, very bouldery-Tuggle, very bouldery, complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Opitz and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Mountain slopes, plateaus, ridges
Slope: 8 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Branham and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 8 to 35 percent
Surface layer texture: Cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Sandy and gravelly residuum derived from granite
Sandy and gravelly colluvium over residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Tuggle and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 8 to 35 percent
Surface layer texture: Very cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy residuum derived from granite
Loamy slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Rock outcrop: 3 percent of the unit
Branham loam and similar soils: 2 percent of the unit
Clugulch and similar soils: 2 percent of the unit
Tepecreek and similar soils: 2 percent of the unit
Foolhen and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2081F—Windham, very stony-Rock outcrop-Lap, very stony, complex, 35 to 70 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Windham and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.5 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard limestone bedrock. Limestone cobbles and stones litter the areas and accumulate at the base of hills and escarpments.

Lap and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Maiden and similar soils: 8 percent of the unit
Judell and similar soils: 7 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2082D—Windham-Judell complex, 8 to 15 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Windham and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Judell and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 8 to 15 percent

Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from limestone
Fine-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.6 inches

Additional Components

Windham, stony, and similar soils: 6 percent of the unit
Judell cobbly loam and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2084E—Windham, stony-Maiden, very stony-Lap, very stony, complex, 15 to 35 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Windham and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.1 inches

Maiden and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Gravelly slope alluvium over residuum derived from limestone
Flooding: None
Available water capacity: Mainly 1.7 inches

Lap and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Maiden soils that have slopes of more than 35 percent: 8 percent of the unit
Judell and similar soils: 7 percent of the unit
Wimper and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2086E—Windham-Windham, stony, complex, 15 to 35 percent slopes, warm

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Windham and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.0 inches

Windham, stony, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.1 inches

Additional Components

Judell and similar soils: 4 percent of the unit
Maiden and similar soils: 4 percent of the unit
Silverchief and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2088D—Windham-Judell gravelly loams, 8 to 25 percent slopes, stony, warm

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Windham and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 8 to 25 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.1 inches

Judell and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, terraces
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from limestone
Fine-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.4 inches

Additional Components

Maiden and similar soils: 8 percent of the unit
Judell soils that have slopes of less than 8 percent: 7 percent of the unit
Wimper and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2090F—Caseypeak, very bouldery-Franconi, very bouldery-Rock outcrop complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet

Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Caseypeak and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy and gravelly slope alluvium over residuum derived from granite
Sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Franconi and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Very cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.6 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock.

Additional Components

Rubble land: 10 percent of the unit
Bobowic and similar soils: 7 percent of the unit
Peeler and similar soils: 6 percent of the unit
Tepecreek and similar soils: 4 percent of the unit
Tuggle and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2091E—Caseypeak, bouldery-Franconi, bouldery-Rock outcrop complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Caseypeak and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Mountainsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Loamy and gravelly slope alluvium over residuum derived from granite
Sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Franconi and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges
Slope: 8 to 35 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite

Fine-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.7 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock.

Additional Components

Rubble land: 10 percent of the unit
Bobowic and similar soils: 6 percent of the unit
Peeler and similar soils: 5 percent of the unit
Tepecreek and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2110D—Sebud very cobbly loam, 4 to 15 percent slopes, very stony

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Sebud and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 4 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Additional Components

Surdal and similar soils: 4 percent of the unit
Arrowpeak and similar soils: 3 percent of the unit
Libeg and similar soils: 3 percent of the unit
Tibkey and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2111E—Sebud, very stony-Hapgood complex, 8 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,000 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Sebud and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 8 to 45 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.6 inches

Hapgood and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, mountain slopes
Slope: 8 to 45 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from basalt
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.6 inches

Additional Components

Surdal and similar soils: 4 percent of the unit
Arrowpeak and similar soils: 3 percent of the unit
Tiban and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2112D—Sebud-Marcel complex, 4 to 25 percent slopes, bouldery

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Sebud and similar soils

Extent: 65 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 25 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.1 inches

Marcel and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 25 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material:
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly alpine till
Native plant cover type: Rangeland
Flooding: None
Water table: Within a depth of 60 inches
Available water capacity: Mainly 7.5 inches

Additional Components

Tibkey and similar soils: 4 percent of the unit
Libeg and similar soils: 3 percent of the unit
Surdal and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2121F—Hapgood-Hanson-Tiban complex, 25 to 60 percent slopes, very stony

Map Unit Setting

Landscape: Mountains, foothills, uplands
Elevation: 4,400 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 95 days

Component Description

Hapgood and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, mountain slopes
Slope: 25 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from basalt
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.5 inches

Hanson and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted

Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.1 inches

Tiban and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Burtoner and similar soils: 5 percent of the unit
Connieo and similar soils: 5 percent of the unit
Firada and similar soils: 4 percent of the unit
Rock outcrop: 4 percent of the unit
Breeton and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2122F—Hapgood-Tiban complex, 35 to 70 percent slopes, very stony

Map Unit Setting

Landscape: Mountains
Elevation: 5,000 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Hapgood and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from basalt
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.5 inches

Tiban and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 35 to 70 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.0 inches

Additional Components

Elve and similar soils: 4 percent of the unit
Worock and similar soils: 4 percent of the unit
Arrowpeak and similar soils: 3 percent of the unit
Hiore and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit
Sebud and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2123F—Hapgood-Sebud-Arrowpeak complex, 35 to 60 percent slopes, very stony

Map Unit Setting

Landscape: Mountains
Elevation: 5,000 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Hapgood and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Very stony loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from basalt
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.5 inches

Sebud and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Arrowpeak and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 35 to 60 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from tuffaceous volcanic rock
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Rock outcrop: 6 percent of the unit
Hiore and similar soils: 5 percent of the unit
Tiban and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2125F—Cowood, rubbly-Elve, very stony-Rock outcrop complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Cowood and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, mountainsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Flooding: None
Available water capacity: Mainly 0.9 inch

Elve and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None

Available water capacity: Mainly 2.2 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Rubble land: 15 percent of the unit
Redfern and similar soils: 3 percent of the unit
Tigeron and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2151E—Releep, very bouldery-Kurrie, very bouldery-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Releep and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Cobbly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.4 inches

Kurrie and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Very cobbly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from granite
Gravelly slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.8 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Caseypeak and similar soils: 5 percent of the unit
Peeler and similar soils: 5 percent of the unit
Warwood and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2161E—Ellena, bouldery-Worock, very bouldery-Rock outcrop complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Ellena and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 15 to 45 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained

Parent material:
- Gravelly colluvium derived from granite over sandy and gravelly residuum derived from granite
- Gravelly residuum derived from granite
- Gravelly slope alluvium derived from granite over sandy and gravelly residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.8 inches

Worock and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from basalt
- Gravelly colluvium derived from metavolcanics
- Gravelly slope alluvium derived from basalt
- Gravelly slope alluvium derived from metavolcanics
- Gravelly till derived from fine grained igneous and metamorphic rocks

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.2 inches

Rock outcrop

Extent: 8 percent of the map unit
Definition: This component consists of exposures of hard, coarse grained (granite) and fine grained (basalt or rhyolite) bedrock. In granitic areas, a thin layer of decomposing granite (grus) covers the surface.

Additional Components

Rubble land: 7 percent of the unit
Cowood and similar soils: 4 percent of the unit
Rubick and similar soils: 3 percent of the unit
Tepecreek and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2161F—Kurrie, very bouldery-Ellena, very bouldery-Rock outcrop complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Kurrie and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Stony sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
- Gravelly colluvium over residuum derived from granite
- Gravelly slope alluvium over residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.9 inches

Ellena and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Very cobbly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
- Gravelly colluvium derived from granite over sandy and gravelly residuum derived from granite
- Gravelly residuum derived from granite
- Gravelly slope alluvium derived from granite over sandy and gravelly residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.6 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Caseypeak and similar soils: 5 percent of the unit
Peeler and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2171F—Hiore-Kurrie, stony, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Hiore and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Mountain slopes, mountain valleys
Slope: 25 to 60 percent
Surface layer texture: Sandy loam
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Sandy and gravelly residuum derived from granite
Sandy and gravelly slope alluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.3 inches

Kurrie and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from granite
Gravelly slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.9 inches

Additional Components

Tepecreek and similar soils: 10 percent of the unit
Caseypeak and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2172F—Rubick, very stony-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Rubick and similar soils

Extent: 75 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 35 to 60 percent
Surface layer texture: Cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material: Gravelly slope alluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.9 inches

Rock outcrop

Extent: 8 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock.

Additional Components

Rubble land: 7 percent of the unit
Caseypeak and similar soils: 5 percent of the unit
Worock and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2173F—Rubick gravelly sandy loam, 35 to 60 percent slopes, stony

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 30 inches
Frost-free period: 30 to 70 days

Component Description

Rubick and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 35 to 60 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material: Gravelly slope alluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.9 inches

Additional Components

Rock outcrop: 3 percent of the unit
Tepecreek and similar soils: 3 percent of the unit
Lowder and similar soils: 2 percent of the unit
Rubble land: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2181F—Repkie, very stony-Yreka, stony-Skyview, very bouldery, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Repkie and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Very gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material: Gravelly colluvium derived from basalt over gravelly colluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.6 inches

Yreka and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly colluvium derived from mixed, fine grained igneous, sedimentary, and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 6.9 inches

Skyview and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Colluvium derived from granite over residuum derived from granite
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over residuum derived from granite

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Additional Components

Roegulch and similar soils: 6 percent of the unit
Hoyt and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2211E—Sebud-Arrowpeak, stony, complex, 8 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 30 inches
Frost-free period: 30 to 70 days

Component Description

Sebud and similar soils

Extent: 65 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 45 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.7 inches

Arrowpeak and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 8 to 15 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from tuffaceous volcanic rock
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Surdal and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Sebud, stony, and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2211F—Sebud, very stony-Arrowpeak, very stony-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Sebud and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Arrowpeak and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 35 to 60 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly colluvium over residuum derived from basalt

Gravelly residuum derived from tuffaceous volcanic rock
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Rubble land: 10 percent of the unit
Libeg and similar soils: 6 percent of the unit
Surdal and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2212D—Sebud, very stony-Libeg-Arrowpeak, stony, complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Sebud and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 4 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Libeg and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.7 inches

Arrowpeak and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 4 to 15 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from tuffaceous volcanic rock
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Additional Components

Surdal and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Tibkey and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2212E—Sebud, very stony-Libeg, stony-Arrowpeak, stony, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Sebud and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Libeg and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 15 to 35 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.9 inches

Arrowpeak and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from tuffaceous volcanic rock
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Additional Components

Surdal and similar soils: 4 percent of the unit
Tibkey and similar soils: 3 percent of the unit
Worock and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2213E—Sebud, stony-Surdal, stony-Arrowpeak, very stony, complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Sebud and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 8 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.6 inches

Surdal and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 8 to 35 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained

Parent material:
Gravelly colluvium over residuum derived from basalt
Gravelly slope alluvium derived from basalt over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.0 inches

Arrowpeak and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from tuffaceous volcanic rock
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Libeg and similar soils: 3 percent of the unit
Tibkey and similar soils: 3 percent of the unit
Marcel and similar soils: 2 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2213F—Sebud, stony-Surdal, stony-Arrowpeak, very stony, complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Sebud and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.6 inches

Surdal and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 35 to 60 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from basalt
Gravelly slope alluvium derived from basalt over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.0 inches

Arrowpeak and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from tuffaceous volcanic rock
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Rock outcrop: 4 percent of the unit
Libeg and similar soils: 2 percent of the unit
Marcel and similar soils: 2 percent of the unit
Tibkey and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2214E—Sebud, bouldery-Surdal, very bouldery-Arrowpeak, very bouldery, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 6,500 to 8,000 feet
Mean annual precipitation: 20 to 30 inches
Frost-free period: 30 to 60 days

Component Description

Sebud and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.1 inches

Surdal and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from basalt
Gravelly slope alluvium derived from basalt over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.0 inches

Arrowpeak and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from tuffaceous volcanic rock
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Arrowpeak soils that have slopes of less than 15 percent: 6 percent of the unit
Rock outcrop: 5 percent of the unit
Worock and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2215D—Sebud-Tibkey cobbly loams, 2 to 15 percent slopes, bouldery

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Sebud and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 2 to 15 percent
Surface layer texture: Cobbly loam

Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.1 inches

Tibkey and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 2 to 15 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material:
Gravelly slope alluvium derived from basalt
Gravelly till derived from basalt
Native plant cover type: Rangeland
Flooding: None
Water table: Within a depth of 60 inches
Available water capacity: Mainly 6.3 inches

Additional Components

Surdal and similar soils: 4 percent of the unit
Marcel and similar soils: 3 percent of the unit
Monaberg and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2216D—Sebud-Surdal complex, 4 to 25 percent slopes, stony

Map Unit Setting

Landscape: Mountains
Elevation: 6,500 to 8,000 feet
Mean annual precipitation: 20 to 30 inches
Frost-free period: 30 to 60 days

Component Description

Sebud and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 4 to 25 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.9 inches

Surdal and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 4 to 25 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from basalt
Gravelly slope alluvium derived from basalt over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.0 inches

Additional Components

Arrowpeak and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2221E—Arrowpeak, very stony-Surdal, stony-Rock outcrop complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 30 inches
Frost-free period: 30 to 70 days

Component Description

Arrowpeak and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Mountain slopes, ridges

Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from tuffaceous volcanic rock
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Surdal and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from basalt
Gravelly slope alluvium derived from basalt over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.0 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Rubble land: 15 percent of the unit
Libeg and similar soils: 3 percent of the unit
Sebud and similar soils: 3 percent of the unit
Tibkey and similar soils: 2 percent of the unit
Tigeron and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2222F—Arrowpeak, very stony-Sebud, stony-Surdal, very stony, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Arrowpeak and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from tuffaceous volcanic rock
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.4 inches

Sebud and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 25 to 60 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.9 inches

Surdal and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 25 to 60 percent

Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from basalt
Gravelly slope alluvium derived from basalt over residuum derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.0 inches

Additional Components

Rock outcrop: 7 percent of the unit
Elve and similar soils: 6 percent of the unit
Libeg and similar soils: 4 percent of the unit
Redfern and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2230B—Tineman cobbly loam, 2 to 8 percent slopes, very stony

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tineman and similar soils

Extent: 80 percent of the map unit
Geomorphic position: Moraines, mountain slopes, mountain valleys
Slope: 2 to 8 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly alluvium over sandy and gravelly recent alluvium derived from igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 6.2 inches

Additional Components

Adel and similar soils: 7 percent of the unit
Sebud and similar soils: 5 percent of the unit
Tibkey and similar soils: 5 percent of the unit
Mooseflat and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2251F—Nivean, very stony-Rock outcrop-Rubble land complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,200 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 80 to 95 days

Component Description

Nivean and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Hillsides, mountain slopes
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from welded tuff
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of welded tuff, rhyolitic tuff, and/or tuffaceous volcanic rocks.

Rubble land

Extent: 15 percent of the map unit
Definition: This component consists of extensive areas of angular to subrounded, tuffaceous cobbles, stones, and boulders. Volcanic ash and glass may be in the soil.

Additional Components

Macabre and similar soils: 10 percent of the unit

Nivean soils that have slopes of less than 25 percent: 5 percent of the unit
Perma and similar soils: 5 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2252E—Nivean, very stony-Macabre, stony-Rock outcrop complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,200 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 80 to 95 days

Component Description

Nivean and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Hillsides, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from welded tuff
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Macabre and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hillsides, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from welded tuff
Gravelly slope alluvium over residuum derived from welded tuff
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.8 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of welded tuff, rhyolitic tuff, and/or tuffaceous volcanic rocks.

Additional Components

Rubble land: 10 percent of the unit
Macabre soils that have slopes of less than 15 percent: 5 percent of the unit
Nivean soils that have slopes of more than 35 percent: 5 percent of the unit
Perma and similar soils: 5 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2261D—Lowland loam, 4 to 15 percent slopes, stony

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Lowland and similar soils

Extent: 75 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 4 to 15 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from tuffaceous volcanic rocks
Gravelly slope alluvium derived from tuffaceous volcanic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.3 inches

Additional Components

Arrowpeak and similar soils: 10 percent of the unit
Lowland soils that have slopes of more than 15 percent: 10 percent of the unit
Judco and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2261E—Lowland loam, 15 to 35 percent slopes, stony

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Lowland and similar soils

Extent: 75 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from tuffaceous volcanic rocks
Gravelly slope alluvium derived from tuffaceous volcanic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.3 inches

Additional Components

Arrowpeak and similar soils: 10 percent of the unit
Lowland soils that have slopes of less than 15 percent: 10 percent of the unit
Judco and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2261F—Lowland, stony-Rock outcrop-Rubble land complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Lowland and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from tuffaceous volcanic rocks
Gravelly slope alluvium derived from tuffaceous volcanic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.3 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of welded tuff, rhyolitic tuff, and/or tuffaceous volcanic rocks.

Rubble land

Extent: 10 percent of the map unit
Definition: This component consists of extensive areas of angular to subrounded, tuffaceous cobbles, stones, and boulders.

Additional Components

Arrowpeak and similar soils: 10 percent of the unit
Lowland soils that have slopes of less than 35 percent: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2270F—Macabre, very stony-Rock outcrop-Rubble land complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,500 to 6,200 feet

Mean annual precipitation: 15 to 24 inches
Frost-free period: 80 to 95 days

Component Description

Macabre and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Hillsides, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from welded tuff
Gravelly slope alluvium over residuum derived from welded tuff
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.8 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of welded tuff, rhyolitic tuff, and/or tuffaceous volcanic rocks.

Rubble land

Extent: 10 percent of the map unit
Definition: This component consists of extensive areas of angular to subrounded, tuffaceous cobbles, stones, and boulders.

Additional Components

Nivean and similar soils: 10 percent of the unit
Macabre, stony, and similar soils: 3 percent of the unit
Macabre, very gravelly, and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2271D—Macabre gravelly loam, 8 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,200 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 80 to 95 days

Component Description

Macabre and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Hillsides, mountain slopes
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from welded tuff
Gravelly slope alluvium over residuum derived from welded tuff
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.8 inches

Additional Components

Nivean and similar soils: 10 percent of the unit
Perma and similar soils: 3 percent of the unit
Rock outcrop: 1 percent of the unit
Rubble land: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2281F—Judco, stony-Torpy, stony-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Judco and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Divides, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 40 to 60 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from welded tuff
Gravelly residuum derived from welded tuff

Gravelly slope alluvium over residuum derived from welded tuff
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.6 inches

Torpy and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from tuffaceous volcanic rocks
Gravelly slope alluvium derived from tuffaceous volcanic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.7 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of welded tuff, rhyolitic tuff, and/or tuffaceous volcanic rocks.

Additional Components

Arrowpeak and similar soils: 10 percent of the unit
Torpy, stony, and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2291F—Mocmont-Kadygulch cobbly loams, 35 to 60 percent slopes, very stony

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 95 days

Component Description

Mocmont and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, mountain slopes, ridges
Slope: 35 to 60 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from fine grained sandstone
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from argillaceous limestone
Gravelly slope alluvium derived from fine grained sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.1 inches

Kadygulch and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 35 to 60 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Sandy and gravelly colluvium derived from granite
Sandy and gravelly slope alluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.6 inches

Additional Components

Hiore and similar soils: 5 percent of the unit
Kurrie and similar soils: 5 percent of the unit
Shaboom and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Rubble land: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2301F—Mocmont, bouldery-Roegulch, rubbly-Rock outcrop complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Mocmont and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, mountain slopes, ridges
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from basalt
- Gravelly colluvium derived from fine grained sandstone
- Gravelly slope alluvium derived from basalt
- Gravelly slope alluvium derived from argillaceous limestone
- Gravelly slope alluvium derived from fine grained sandstone

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.1 inches

Roegulch and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Rubble land: 5 percent of the unit
Brickner and similar soils: 2 percent of the unit
Sawbuck and similar soils: 2 percent of the unit
Cometcrik and similar soils: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2311F—Worock, stony-Cowood, very stony-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Worock and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Very gravelly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from basalt
- Gravelly colluvium derived from metavolcanics
- Gravelly slope alluvium derived from basalt
- Gravelly slope alluvium derived from metavolcanics
- Gravelly till derived from fine grained igneous and metamorphic rocks

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.2 inches

Cowood and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, mountainsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Very channery sandy loam

Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Rock outcrop

Extent: 5 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Arrowpeak and similar soils: 5 percent of the unit
Elve and similar soils: 5 percent of the unit
Rubble land: 5 percent of the unit
Worock soils that have slopes of less than 35 percent: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2312F—Worock, stony-Elve, stony-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Worock and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Very gravelly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly till derived from fine grained igneous and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.2 inches

Elve and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Very gravelly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.1 inches

Rock outcrop

Extent: 5 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Cowood and similar soils: 5 percent of the unit
Rubble land: 5 percent of the unit
Worock soils that have slope of less than 35 percent: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2321D—Torpy loam, 4 to 15 percent slopes

Map Unit Setting

Landscape: Mountains, foothills
Elevation: 4,500 to 8,000 feet

Mean annual precipitation: 15 to 24 inches
Frost-free period: 30 to 95 days

Component Description

Torpy and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 4 to 15 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from tuffaceous volcanic rocks
Gravelly slope alluvium derived from tuffaceous volcanic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.9 inches

Additional Components

Vitroff and similar soils: 6 percent of the unit
Nivean and similar soils: 5 percent of the unit
Rock outcrop: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2321E—Torpy gravelly loam, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Torpy and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from tuffaceous volcanic rocks
Gravelly slope alluvium derived from tuffaceous volcanic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Torpy soils that have slopes of more than 35 percent: 5 percent of the unit
Arrowpeak and similar soils: 3 percent of the unit
Arrowpeak, very stony, and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2321F—Torpy gravelly loam, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Torpy and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from tuffaceous volcanic rocks
Gravelly slope alluvium derived from tuffaceous volcanic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.7 inches

Additional Components

Torpy soils that have slopes of less than 35 percent: 10 percent of the unit
Arrowpeak and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2322E—Lowland-Torpy complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Lowland and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Gravelly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from tuffaceous volcanic rocks
- Gravelly slope alluvium derived from tuffaceous volcanic rocks

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.8 inches

Torpy and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from tuffaceous volcanic rocks
- Gravelly slope alluvium derived from tuffaceous volcanic rocks

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.9 inches

Additional Components

Arrowpeak and similar soils: 5 percent of the unit
Judco and similar soils: 5 percent of the unit
Rock outcrop: 3 percent of the unit
Rubble land: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2322F—Lowland-Torpy complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Lowland and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Gravelly sandy clay loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from tuffaceous volcanic rocks
- Gravelly slope alluvium derived from tuffaceous volcanic rocks

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.8 inches

Torpy and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from tuffaceous volcanic rocks
- Gravelly slope alluvium derived from tuffaceous volcanic rocks

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.9 inches

Additional Components

Arrowpeak and similar soils: 5 percent of the unit
Torpy soils that have slopes of less than 35 percent: 5 percent of the unit
Rock outcrop: 3 percent of the unit
Rubble land: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2331B—Mooseflat loam, 1 to 4 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Mooseflat and similar soils

Extent: 80 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 1 to 4 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Organic material over fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Frequent
Water table: Within a depth of 60 inches
Ponding duration: Brief
Available water capacity: Mainly 5.4 inches

Additional Components

Elvick and similar soils: 10 percent of the unit
Libeg and similar soils: 10 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2332B—Mooseflat-Elvick loams, 1 to 4 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Mooseflat and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 1 to 4 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Organic material over fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Frequent
Water table: Within a depth of 60 inches
Ponding duration: Brief
Available water capacity: Mainly 5.4 inches

Elvick and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, drainageways, flood plains, flood-plain steps
Slope: 1 to 4 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Fine-loamy over sandy and gravelly recent alluvium derived from mixed igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Water table: Within a depth of 60 inches
Available water capacity: Mainly 4.4 inches

Additional Components

Libeg and similar soils: 15 percent

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2350D—Clasoil, very stony-Sawicki, bouldery, complex, 4 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Clasoil and similar soils

Extent: 65 percent of the map unit
Geomorphic position: Alluvial fans, hillsides
Slope: 4 to 15 percent
Surface layer texture: Cobbly sandy loam

Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Fine-loamy alluvium derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.1 inches

Sawicki and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, mountain slopes
Slope: 4 to 15 percent
Surface layer texture: Cobbly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.1 inches

Additional Components

Clasoil soils that have slopes of more than 15 percent: 6 percent of the unit
Sawicki soils that have slopes of more than 15 percent: 5 percent of the unit
Bielenberg and similar soils: 4 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2360E—Gnojek, stony-Wickes, stony-Shawmut complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,200 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Gnojek and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.1 inches

Wickes and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 8 to 25 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt over residuum derived from basalt
Gravelly colluvium over residuum derived from sandstone
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.2 inches

Shawmut and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 8 to 15 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.0 inches

Additional Components

Shawmut, bouldery, and similar soils: 4 percent of the unit

Absarook and similar soils: 3 percent of the unit
Perma and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2360F—Gnojek, stony-Wickes, stony-Rock outcrop complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,200 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Gnojek and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.1 inches

Wickes and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 35 to 70 percent
Surface layer texture: Very gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt over residuum derived from basalt
Gravelly colluvium over residuum derived from sandstone
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.1 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Additional Components

Rubble land: 10 percent of the unit
Shawmut and similar soils: 4 percent of the unit
Absarook and similar soils: 3 percent of the unit
Brickner and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2361E—Gnojek, stony-Wickes, stony-Rock outcrop complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,200 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Gnojek and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Wickes and similar soils

Extent: 25 percent of the map unit

Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 8 to 35 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt over residuum derived from basalt
Gravelly colluvium over residuum derived from sandstone
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.2 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Additional Components

Shawmut and similar soils: 4 percent of the unit
Absarook and similar soils: 3 percent of the unit
Brickner and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2361F—Gnojek, stony-Rock outcrop-Wickes, stony, complex, 25 to 60 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 4,400 to 6,200 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Gnojek and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Wickes and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, interfluves, ridges
Slope: 25 to 60 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt over residuum derived from basalt
Gravelly colluvium over residuum derived from sandstone
Gravelly slope alluvium over residuum derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.2 inches

Additional Components

Shawmut and similar soils: 4 percent of the unit
Absarook and similar soils: 3 percent of the unit
Brickner and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2391C—Marcel, very bouldery-Tibkey, bouldery, complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Marcel and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 2 to 8 percent
Surface layer texture: Gravelly silt loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material:
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly alpine till
Native plant cover type: Rangeland
Flooding: None
Water table: Within a depth of 60 inches
Available water capacity: Mainly 7.8 inches

Tibkey and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 2 to 8 percent
Surface layer texture: Mucky silt loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material:
Gravelly slope alluvium derived from basalt
Gravelly till derived from basalt
Native plant cover type: Rangeland
Flooding: None
Water table: Within a depth of 60 inches
Available water capacity: Mainly 6.8 inches

Additional Components

Sebud and similar soils: 6 percent of the unit
Libeg and similar soils: 5 percent of the unit
Monaberg and similar soils: 5 percent of the unit
Elvick and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2411E—Ashbray, bouldery-Rock outcrop-Rubble land complex, 8 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, mountains, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Ashbray and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 8 to 45 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.0 inch

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock.

Rubble land

Extent: 20 percent of the map unit
Definition: This component consists of areas of hard, rounded granite cobbles, stones, and boulders.

Additional Components

Baxton and similar soils: 5 percent of the unit
Elmark and similar soils: 4 percent of the unit
Catgulch and similar soils: 3 percent of the unit
Connieo and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2412F—Ashbray, rubbly-Rock outcrop-Kellygulch, very stony, complex, 35 to 70 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Ashbray and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Stony coarse sandy loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material:
Sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.0 inch

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock.

Kellygulch and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 35 to 70 percent
Surface layer texture: Very cobbly sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Coarse-loamy colluvium over residuum derived from granite
Coarse-loamy residuum derived from granite
Coarse-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.8 inches

Additional Components

Rubble land: 15 percent of the unit
Connieo and similar soils: 4 percent of the unit
Catgulch and similar soils: 3 percent of the unit
Elmark and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2421E—Surdal, stony-Arrowpeak, very stony, complex, 4 to 25 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 30 inches
Frost-free period: 30 to 70 days

Component Description

Surdal and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, mountain slopes, ridges
Slope: 4 to 25 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from basalt
Gravelly slope alluvium derived from basalt over residuum derived from basalt
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.4 inches

Arrowpeak and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Mountain slopes, ridges
Slope: 4 to 25 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)

Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly colluvium over residuum derived from basalt
Gravelly residuum derived from tuffaceous volcanic rock
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.8 inches

Additional Components

Sebud and similar soils: 8 percent of the unit
Tibkey and similar soils: 7 percent of the unit
Nieman and similar soils: 4 percent of the unit
Monaberg and similar soils: 3 percent of the unit
Rock outcrop: 3 percent of the unit
Rubble land: 3 percent of the unit
Libeg and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2431C—Foolhen, stony-Tibkey, bouldery, complex, 0 to 8 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Foolhen and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps
Slope: 0 to 4 percent
Surface layer texture: Mucky loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material: Organic, herbaceous material over fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 7.6 inches

Tibkey and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 2 to 8 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material:
Gravelly slope alluvium derived from basalt
Gravelly till derived from basalt
Native plant cover type: Rangeland
Flooding: None
Water table: Within a depth of 60 inches
Available water capacity: Mainly 6.3 inches

Additional Components

Sebud and similar soils: 5 percent of the unit
Marcel and similar soils: 4 percent of the unit
Elvick and similar soils: 2 percent of the unit
Lowder and similar soils: 2 percent of the unit
Monaberg and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2441E—Tineman, very stony-Franconi, bouldery-Rock outcrop complex, 4 to 25 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Tineman and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Moraines, mountain slopes, mountain valleys
Slope: 4 to 25 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly alluvium over sandy and gravelly recent alluvium derived from igneous, sedimentary, and metamorphic rocks
Native plant cover type: Forest land

Flooding: None
Available water capacity: Mainly 6.2 inches

Franconi and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges
Slope: 4 to 25 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy colluvium over residuum derived from granite
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.7 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Caseypeak and similar soils: 4 percent of the unit
Worock and similar soils: 4 percent of the unit
Elvick and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2450E—Kounter, bouldery-Rock outcrop-Cedric, bouldery, complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Kounter and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.8 inch

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Cedric and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, hills, ridges
Slope: 8 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Additional Components

Burtoner and similar soils: 4 percent of the unit
Jeffcity and similar soils: 3 percent of the unit
Placerton and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2451D—Kounter, bouldery-Rock outcrop-Cedric, bouldery, complex, 4 to 25 percent slopes, dry

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Kounter and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 4 to 25 percent
Surface layer texture: Cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.8 inch

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Cedric and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, hills, ridges
Slope: 4 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Additional Components

Jeffcity and similar soils: 5 percent of the unit
Placerton and similar soils: 4 percent of the unit
Breeton and similar soils: 3 percent of the unit
Burtoner and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2452E—Kounter, very bouldery-Rock outcrop-Jeffcity, bouldery, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Kounter and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Very cobbly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Parent material: Sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.8 inch

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Jeffcity and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 35 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained

Parent material:
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.4 inches

Additional Components

Cedric and similar soils: 4 percent of the unit
Breeton and similar soils: 3 percent of the unit
Placerton and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2460D—Cedric, bouldery-Jeffcity, bouldery-Rock outcrop complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Cedric and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Divides, hills, ridges
Slope: 2 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Jeffcity and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.4 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Kounter and similar soils: 4 percent of the unit
Martinsdale and similar soils: 3 percent of the unit
Placerton and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2461D—Cedric, bouldery-Rock outcrop-Jeffcity, bouldery, complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Cedric and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Divides, hills, ridges
Slope: 2 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 1.4 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Jeffcity and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 2 to 15 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Fine-loamy residuum derived from granite
Fine-loamy slope alluvium over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.4 inches

Additional Components

Kounter and similar soils: 4 percent of the unit
Catgulch and similar soils: 2 percent of the unit
Martinsdale and similar soils: 2 percent of the unit
Placerton and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2471F—Elve, stony-Worock, stony-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,000 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Elve and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.6 inches

Worock and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly till derived from fine grained igneous and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.7 inches

Rock outcrop

Extent: 20 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock. Boulders and stones make up a small part of the areas.

Additional Components

Cowood and similar soils: 3 percent of the unit
Hapgood and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2472E—Elvick-Lowder complex, 8 to 25 percent slopes, very bouldery

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Elvick and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, drainageways
Slope: 8 to 25 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Water table: Within a depth of 60 inches
Available water capacity: Mainly 4.0 inches

Lowder and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, flood-plain steps, recessional moraines, swales
Slope: 8 to 25 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material:
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly till derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Water table: Within a depth of 60 inches
Available water capacity: Mainly 4.7 inches

Additional Components

Elve and similar soils: 5 percent of the unit
Worock and similar soils: 4 percent of the unit
Marcel and similar soils: 3 percent of the unit
Sebud and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2473E—Elve-Cowood very cobbly loams, 8 to 35 percent slopes, very stony

Map Unit Setting

Landscape: Mountains
Elevation: 6,500 to 8,500 feet
Mean annual precipitation: 20 to 30 inches
Frost-free period: 30 to 60 days

Component Description

Elve and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Cowood and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Escarpments, mountainsides, ridges
Slope: 8 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained

Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.0 inch

Additional Components

Arrowpeak and similar soils: 5 percent of the unit
Worock and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Rubble land: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2481F—Brickner, very bouldery-Rock outcrop-Rubble land complex, 15 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Brickner and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 15 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Rubble land

Extent: 25 percent of the map unit
Definition: This component consists of extensive areas of hard, fine grained, angular volcanic cobbles, stones, and boulders.

Additional Components

Blaincreek and similar soils: 6 percent of the unit
Hilger and similar soils: 4 percent of the unit
Mocmont and similar soils: 4 percent of the unit
Sawicki and similar soils: 3 percent of the unit
Tolbert and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2483F—Elve, rubbly-Rock outcrop-Rubble land association, 25 to 60 percent slopes, cool

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,500 feet
Mean annual precipitation: 15 to 30 inches
Frost-free period: 30 to 70 days

Component Description

Elve and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 25 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Rubble land

Extent: 25 percent of the map unit
Definition: This component consists of extensive areas

of hard, fine grained, angular volcanic cobbles, stones, and boulders.

Additional Components

Worock and similar soils: 6 percent of the unit
Cowood and similar soils: 5 percent of the unit
Redfern and similar soils: 4 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2484F—Rock outcrop-Rubble land-Redfern, rubbly, association, 35 to 70 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Rubble land

Extent: 25 percent of the map unit
Definition: This component consists of extensive areas of hard, fine grained, angular volcanic cobbles, stones, and boulders.

Redfern and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, mountain slopes, ridges
Slope: 35 to 70 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Helmville and similar soils: 15 percent of the unit
Worock and similar soils: 5 percent of the unit
Elve and similar soils: 4 percent of the unit
Cowood and similar soils: 3 percent of the unit
Tigeron and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2485F—Redfern, rubbly-Rock outcrop-Tigeron, very bouldery, association, 25 to 70 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Redfern and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Divides, escarpments, mountain slopes, ridges
Slope: 25 to 70 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.3 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Tigeron and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges, saddles
Slope: 25 to 50 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained

Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.0 inches

Additional Components

Rubble land: 20 percent of the unit
Elve and similar soils: 4 percent of the unit
Cowood and similar soils: 3 percent of the unit
Worock and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2486F—Elve, rubbly-Rock outcrop-Rubble land complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Elve and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Rubble land

Extent: 25 percent of the map unit
Definition: This component consists of extensive areas of hard, fine grained, angular volcanic cobbles, stones, and boulders.

Additional Components

Tigeron and similar soils: 7 percent of the unit
Redfern and similar soils: 6 percent of the unit
Cowood and similar soils: 4 percent of the unit
Helmville and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2487F—Torpy, rubbly-Rock outcrop-Rubble land complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains, foothills
Elevation: 4,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 95 days

Component Description

Torpy and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from tuffaceous volcanic rocks
Gravelly slope alluvium derived from tuffaceous volcanic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.8 inches

Rock outcrop

Extent: 30 percent of the map unit
Definition: This component consists mainly of exposed areas of welded tuff, rhyolitic tuff, and/or tuffaceous volcanic rocks.

Rubble land

Extent: 25 percent of the map unit
Definition: This component consists of extensive areas of angular to subrounded, tuffaceous cobbles, stones, and boulders.

Additional Components

Nivean and similar soils: 5 percent of the unit
Lowland and similar soils: 4 percent of the unit
Arrowpeak and similar soils: 3 percent of the unit
Macabre and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2488D—Elve, very stony-Rock outcrop-Rubble land complex, 4 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Elve and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 4 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Rock outcrop

Extent: 25 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Rubble land

Extent: 20 percent of the map unit
Definition: This component consists of extensive areas of hard, fine grained, angular volcanic cobbles, stones, and boulders.

Additional Components

Elvick and similar soils: 15 percent of the unit
Worock and similar soils: 3 percent of the unit
Redfern and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2501D—Lowder-Elvick very cobbly loams, 2 to 15 percent slopes, very bouldery

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Lowder and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, flood-plain steps, recessional moraines, swales
Slope: 2 to 8 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Very poorly drained
Parent material:
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly till derived from metavolcanics
Native plant cover type: Forest land
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 4.7 inches

Elvick and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, drainageways
Slope: 2 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land

Flooding: None
Water table: Within a depth of 60 inches
Available water capacity: Mainly 4.0 inches

Additional Components

Worock and similar soils: 5 percent of the unit
Sebud and similar soils: 3 percent of the unit
Foolhen and similar soils: 2 percent of the unit
Rock outcrop: 2 percent of the unit
Tibkey and similar soils: 2 percent of the unit
Rubble land: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2511C—Monaberg loam, 2 to 8 percent slopes, bouldery

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Monaberg and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 2 to 8 percent
Surface layer texture: Loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy slope alluvium derived from basalt
Fine-loamy slope alluvium derived from fine grained igneous and metamorphic rocks
Fine-loamy alpine till derived from fine grained igneous and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.8 inches

Additional Components

Sebud and similar soils: 5 percent of the unit
Marcel and similar soils: 4 percent of the unit
Libeg and similar soils: 3 percent of the unit
Tibkey and similar soils: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2581E—Worock, very bouldery-Elve, very stony, complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 6,000 to 8,000 feet
Mean annual precipitation: 20 to 30 inches
Frost-free period: 30 to 60 days

Component Description

Worock and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly till derived from fine grained igneous and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.2 inches

Elve and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Additional Components

Tepecreek and similar soils: 4 percent of the unit
Warwood and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit
Rubble land: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2582D—Worock-Elve very cobbly loams, 2 to 15 percent slopes, very bouldery, cool

Map Unit Setting

Landscape: Mountains
Elevation: 6,000 to 8,000 feet
Mean annual precipitation: 20 to 30 inches
Frost-free period: 30 to 60 days

Component Description

Worock and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 2 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly till derived from fine grained igneous and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.2 inches

Elve and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 2 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.2 inches

Additional Components

Tepecreek and similar soils: 6 percent of the unit
Warwood and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Rubble land: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2582E—Worock, very bouldery-Worock, rubbly, complex, 8 to 35 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,500 feet
Mean annual precipitation: 15 to 30 inches
Frost-free period: 30 to 70 days

Component Description

Worock, very bouldery, and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 8 to 35 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly till derived from fine grained igneous and metamorphic rocks

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.8 inches

Worock, rubbly, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 8 to 35 percent
Surface layer texture: Extremely stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly till derived from fine grained igneous and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.7 inches

Additional Components

Elve and similar soils: 6 percent of the unit
Cowood and similar soils: 5 percent of the unit
Tigeron and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Rubble land: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2582F—Worock, rubbly-Rock outcrop-Rubble land complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 6,500 to 8,500 feet
Mean annual precipitation: 20 to 30 inches
Frost-free period: 30 to 60 days

Component Description

Worock and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Extremely stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly till derived from fine grained igneous and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.7 inches

Rock outcrop

Extent: 15 percent of the map unit
Definition: Ths component consists mainly of exposed areas of hard, fractured, fine grained volcanic extrusive bedrock.

Rubble land

Extent: 15 percent of the map unit
Definition: This component consists of extensive areas of hard, fine grained, angular volcanic cobbles, stones, and boulders.

Additional Components

Elve and similar soils: 8 percent of the unit
Cowood and similar soils: 7 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2583D—Worock, stony-Worock, very bouldery, complex, 2 to 15 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Worock, stony, and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys

Slope: 2 to 15 percent
Surface layer texture: Cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from basalt
- Gravelly colluvium derived from metavolcanics
- Gravelly slope alluvium derived from basalt
- Gravelly slope alluvium derived from metavolcanics
- Gravelly till derived from fine grained igneous and metamorphic rocks

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.7 inches

Worock, very bouldery, and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 2 to 15 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from basalt
- Gravelly colluvium derived from metavolcanics
- Gravelly slope alluvium derived from basalt
- Gravelly slope alluvium derived from metavolcanics
- Gravelly till derived from fine grained igneous and metamorphic rocks

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.2 inches

Additional Components

Tibkey and similar soils: 7 percent of the unit
Sebud and similar soils: 6 percent of the unit
Elvick and similar soils: 5 percent of the unit
Elve and similar soils: 4 percent of the unit
Tigeron and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2583F—Worock, very bouldery-Worock, rubbly, complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Worock, very bouldery, and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from basalt
- Gravelly colluvium derived from metavolcanics
- Gravelly slope alluvium derived from basalt
- Gravelly slope alluvium derived from metavolcanics
- Gravelly till derived from fine grained igneous and metamorphic rocks

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.2 inches

Worock, rubbly, and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 35 to 60 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
- Gravelly colluvium derived from basalt
- Gravelly colluvium derived from metavolcanics
- Gravelly slope alluvium derived from basalt
- Gravelly slope alluvium derived from metavolcanics
- Gravelly till derived from fine grained igneous and metamorphic rocks

Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.8 inches

Additional Components

Elve and similar soils: 7 percent of the unit
Rock outcrop: 7 percent of the unit
Tepecreek and similar soils: 6 percent of the unit
Tibkey and similar soils: 4 percent of the unit
Cowood and similar soils: 3 percent of the unit
Tigeron and similar soils: 3 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2584E—Worock, very bouldery-Worock, rubbly, complex, 15 to 45 percent slopes, dry

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Worock, very bouldery, and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 15 to 45 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly till derived from fine grained igneous and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.2 inches

Worock, rubbly, and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 15 to 45 percent
Surface layer texture: Very stony loam
Percent of surface covered by rock fragments: 15 to 50 percent (boulders)
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from metavolcanics
Gravelly slope alluvium derived from basalt
Gravelly slope alluvium derived from metavolcanics
Gravelly till derived from fine grained igneous and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.8 inches

Additional Components

Elve and similar soils: 6 percent of the unit
Cowood and similar soils: 5 percent of the unit
Rock outcrop: 3 percent of the unit
Rubble land: 3 percent of the unit
Redfern and similar soils: 3 percent of the unit
Tigeron and similar soils: 3 percent of the unit
Helmville and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2591F—Kadygulch-Roegulch, stony, complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Kadygulch and similar soils

Extent: 70 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides
Slope: 35 to 60 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained

Parent material:
Sandy and gravelly colluvium derived from granite
Sandy and gravelly slope alluvium derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.6 inches

Roegulch and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Gravelly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly slope alluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Additional Components

Breeton and similar soils: 7 percent of the unit
Yreka and similar soils: 5 percent of the unit
Rock outcrop: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2661F—Elve-Cowood complex, 45 to 70 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Elve and similar soils

Extent: 65 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 45 to 70 percent
Surface layer texture: Very gravelly sandy loam
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt
Flooding: None
Available water capacity: Mainly 2.3 inches

Cowood and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Escarpments, mountainsides, ridges
Slope: 45 to 70 percent
Surface layer texture: Very channery sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Worock and similar soils: 5 percent of the unit
Elvick and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Rubble land: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2662E—Elve-Cowood complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 6,000 to 8,000 feet
Mean annual precipitation: 20 to 30 inches
Frost-free period: 30 to 60 days

Component Description

Elve and similar soils

Extent: 70 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys
Slope: 15 to 45 percent
Surface layer texture: Very gravelly sandy loam
Restrictive feature: None noted
Drainage class: Somewhat excessively drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly slope alluvium derived from basalt

Flooding: None
Available water capacity: Mainly 2.3 inches

Cowood and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Escarpments, mountainsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Very channery sandy loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from sandstone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Worock and similar soils: 5 percent of the unit
Warwood and similar soils: 4 percent of the unit
Rock outcrop: 3 percent of the unit
Rubble land: 3 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2681E—Sawbuck-Catgulch, stony, complex, 8 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Sawbuck and similar soils

Extent: 65 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, mountain slopes
Slope: 15 to 45 percent
Surface layer texture: Gravelly sandy loam
Depth to restrictive feature: 46 to 60 inches to bedrock (paralithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt over residuum derived from granite
Gravelly colluvium derived from granite over residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.4 inches

Catgulch and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 8 to 15 percent
Surface layer texture: Gravelly sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Crackerville and similar soils: 6 percent of the unit
Sawicki and similar soils: 4 percent of the unit
Bielenberg and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2682E—Sawbuck, stony-Yreka, stony-Catgulch, very stony, complex, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 105 days

Component Description

Sawbuck and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, mountain slopes
Slope: 15 to 45 percent
Surface layer texture: Very gravelly sandy clay loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 46 to 60 inches to bedrock (paralithic)
Drainage class: Well drained

Parent material:
Gravelly colluvium derived from basalt over residuum derived from granite
Gravelly colluvium derived from granite over residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.4 inches

Yreka and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, mountain slopes, ridges
Slope: 30 to 45 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly colluvium derived from mixed, fine grained igneous, sedimentary, and metamorphic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 6.9 inches

Catgulch and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 15 to 45 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Yreka soils that have slopes of more than 45 percent: 6 percent of the unit
Skyview and similar soils: 4 percent of the unit
Hoyt and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2691F—Connieo, very stony-Crackerville, stony-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 105 days

Component Description

Connieo and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Loamy residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.6 inches

Crackerville and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, ridges
Slope: 35 to 60 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from granite over sandy and gravelly residuum derived from granite
Gravelly residuum derived from granite
Gravelly slope alluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.9 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus)

covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Bielenberg and similar soils: 5 percent of the unit
Clancy and similar soils: 4 percent of the unit
Ashbray and similar soils: 2 percent of the unit
Breeton and similar soils: 2 percent of the unit
Burtoner and similar soils: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2695E—Macabre-Nivean complex, 15 to 35 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,500 to 6,200 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 80 to 95 days

Component Description

Macabre and similar soils

Extent: 75 percent of the map unit
Geomorphic position: Hillsides, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Very gravelly sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from welded tuff
Gravelly slope alluvium over residuum derived from welded tuff
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.8 inches

Nivean and similar soils

Extent: 10 percent of the map unit
Geomorphic position: Hillsides, mountain slopes
Slope: 15 to 35 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from welded tuff
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Rock outcrop: 5 percent of the unit
Rubble land: 5 percent of the unit
Macabre soils that have slopes of more than 35 percent: 3 percent of the unit
Nivean soils that have slopes of more than 35 percent: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

2695F—Macabre-Judco-Rock outcrop complex, 35 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, mountains
Elevation: 4,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 95 days

Component Description

Macabre and similar soils

Extent: 75 percent of the map unit
Geomorphic position: Hillsides, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Very gravelly sandy clay loam
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from welded tuff
Gravelly slope alluvium over residuum derived from welded tuff
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.8 inches

Judco and similar soils

Extent: 5 percent of the map unit
Geomorphic position: Divides, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Very cobbly loam
Percent of surface covered by rock fragments: 0.01 to 0.10 percent (stones)
Depth to restrictive feature: 40 to 60 inches to bedrock (paralithic)
Drainage class: Well drained

Parent material:
Gravelly colluvium over residuum derived from welded tuff
Gravelly residuum derived from welded tuff
Gravelly slope alluvium over residuum derived from welded tuff
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 3.6 inches

Rock outcrop

Extent: 5 percent of the map unit
Definition: This component consists mainly of exposed areas of welded tuff, rhyolitic tuff, and/or tuffaceous volcanic rocks.

Additional Components

Macabre, stony, and similar soils: 5 percent of the unit
Nivean and similar soils: 5 percent of the unit
Rubble land: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2701F—Crampton-Catgulch complex, 35 to 60 percent slopes, very stony

Map Unit Setting

Landscape: Foothills
Elevation: 4,400 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 80 to 95 days

Component Description

Crampton and similar soils

Extent: 70 percent of the map unit
Geomorphic position: Escarpments, hills, ridges
Slope: 35 to 60 percent
Surface layer texture: Coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic); 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over sandy and gravelly residuum derived from granite
Gravelly residuum derived from granite
Gravelly slope alluvium over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 2.3 inches

Catgulch and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges, spurs
Slope: 35 to 60 percent
Surface layer texture: Gravelly coarse sandy loam
Percent of surface covered by rock fragments: 0.10 to 3.00 percent (stones)
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 0.9 inch

Additional Components

Burtoner and similar soils: 3 percent of the unit
Kellygulch and similar soils: 3 percent of the unit
Rock outcrop: 2 percent of the unit
Shaboom and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2705F—Vitroff-Torpy loams, 35 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,000 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Vitroff and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, saddles
Slope: 35 to 60 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Fine-loamy colluvium derived from tuffaceous volcanic rock

Fine-loamy slope alluvium derived from tuffaceous volcanic rock
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.9 inches

Torpy and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes
Slope: 35 to 60 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from tuffaceous volcanic rocks
Gravelly slope alluvium derived from tuffaceous volcanic rocks
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 5.9 inches

Additional Components

Judco and similar soils: 10 percent of the unit
Rock outcrop: 2 percent of the unit
Vitroff soils that have slopes of 18 to 25 percent: 2 percent of the unit
Rubble land: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2711E—Libeg very gravelly loam, 15 to 45 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 8,000 feet
Mean annual precipitation: 15 to 30 inches
Frost-free period: 30 to 70 days

Component Description

Libeg and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 15 to 45 percent
Surface layer texture: Very gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.3 inches

Additional Components

Arrowpeak and similar soils: 10 percent of the unit
Elve and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

2712D—Libeg-Mooseflat loams, 4 to 25 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,500 to 7,500 feet
Mean annual precipitation: 15 to 24 inches
Frost-free period: 50 to 70 days

Component Description

Libeg and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, mountain valleys, outwash terraces
Slope: 4 to 25 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly alluvium
Gravelly colluvium
Gravelly slope alluvium
Gravelly till
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.9 inches

Mooseflat and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 4 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted

Drainage class: Very poorly drained
Parent material: Organic material over fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Frequent
Water table: Within a depth of 60 inches
Available water capacity: Mainly 5.4 inches

Additional Components

Libeg, very gravelly: 10 percent of the unit
Marcel and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

3001B—Aridic Ustifluvents, 0 to 4 percent slopes

Map Unit Setting

Landscape: Valleys, river valleys
Elevation: 3,500 to 4,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 90 to 120 days

Component Description

Aridic Ustifluvents and similar soils

Extent: 90 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 4 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Native plant cover type: Rangeland
Frequency of flooding: Rare
Available water capacity: Mainly 4.7 inches

Additional Components

Rivra and similar soils: 4 percent of the unit
Ryell and similar soils: 4 percent of the unit
Fairway and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

3033B—Sappington-Amesha loams, 1 to 4 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 4,300 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 120 days

Component Description

Sappington and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 1 to 4 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Amesha and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 1 to 4 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.2 inches

Additional Components

Sappington soils that have slopes of more than 4 percent: 3 percent of the unit
Musselshell and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

3033C—Sappington-Amesha loams, 4 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,800 to 4,300 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 120 days

Component Description

Sappington and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 4 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Calcareous, coarse-loamy Tertiary valley fill alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 8.2 inches

Amesha and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, knolls, plains
Slope: 4 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, coarse-loamy Tertiary valley fill alluvium
Calcareous, gravelly colluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 9.2 inches

Additional Components

Amesha soils that have slopes of more than 8 percent: 4 percent of the unit
Sappington, gravelly, and similar soils: 4 percent of the unit
Crago and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

3061E—Holter-Castner channery loams, 8 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, mountains
Elevation: 4,500 to 6,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 110 days

Component Description

Holter and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, hillsides
Slope: 8 to 45 percent
Surface layer texture: Channery loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from basalt
Gravelly colluvium derived from argillaceous limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 5.2 inches

Castner and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Hills, hillsides, ridges
Slope: 8 to 45 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from basalt
Gravelly residuum derived from fine grained sandstone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.2 inches

Additional Components

Castner soils that have slopes of more than 45 percent: 5 percent of the unit
Mocmont and similar soils: 5 percent of the unit
Rock outcrop: 3 percent of the unit
Blaincreek and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

3064D—Windham channery loam, 4 to 15 percent slopes

Map Unit Setting

Landscape: Uplands, foothills
Elevation: 3,500 to 5,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 110 days

Component Description

Windham and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 4 to 15 percent
Surface layer texture: Channery loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Additional Components

Beanlake and similar soils: 3 percent of the unit
Windham, cobbly, and similar soils: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

3137B—Musselshell-Crago complex, 2 to 8 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,600 to 4,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 120 days

Component Description

Musselshell and similar soils

Extent: 70 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, plains
Slope: 2 to 8 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium derived from limestone
Coarse-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.5 inches

Crago and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.8 inches

Additional Components

Amesha and similar soils: 2 percent of the unit
Crago, cobbly, and similar soils: 2 percent of the unit
Delpoint and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

3141E—Crago-Pensore channery loams, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands, valleys
Elevation: 3,800 to 5,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 120 days

Component Description

Crago and similar soils

Extent: 55 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 15 to 45 percent
Surface layer texture: Channery loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland

Flooding: None
Available water capacity: Mainly 3.8 inches

Pensore and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Escarpments, hillsides, knolls, ridges, strath terraces
Slope: 15 to 45 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material: Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.4 inches

Additional Components

Musselshell and similar soils: 3 percent of the unit
Whitecow and similar soils: 3 percent of the unit
Delpoint and similar soils: 2 percent of the unit
Rock outcrop: 2 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

3218A—Meadowcreek-Fairway complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,600 to 4,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 120 days

Component Description

Meadowcreek and similar soils

Extent: 70 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 6.4 inches

Fairway and similar soils

Extent: 25 percent of the map unit
Geomorphic position: Flood plains, flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 8.7 inches

Additional Components

Havre and similar soils: 2 percent of the unit
Villy and similar soils: 2 percent of the unit
Rivra and similar soils: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

3233C—Geohrock-Crago very cobbly loams, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,600 to 4,300 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 120 days

Component Description

Geohrock and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 2 to 8 percent
Surface layer texture: Very cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly Tertiary valley fill alluvium
Gravelly slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.5 inches

Crago and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 2 to 8 percent
Surface layer texture: Very cobbly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.3 inches

Additional Components

Geohrock soils that have slopes of more than 8 percent: 5 percent of the unit
Nippt and similar soils: 5 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

3433E—Crago-Musselshell gravelly loams, 4 to 35 percent slopes

Map Unit Setting

Landscape: Uplands, valleys
Elevation: 3,600 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 120 days

Component Description

Crago and similar soils

Extent: 50 percent of the map unit
Geomorphic position: Alluvial fans, escarpments, hillsides, plains
Slope: 4 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Calcareous, gravelly alluvium derived from limestone
Calcareous, gravelly colluvium derived from limestone
Calcareous, gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.8 inches

Musselshell and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Alluvial fans, hillsides, plains
Slope: 4 to 35 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Coarse-loamy alluvium derived from limestone
Coarse-loamy slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 7.4 inches

Additional Components

Amesha and similar soils: 3 percent of the unit
Crago soils that have slopes of more than 35 percent: 3 percent of the unit
Crago, cobbly, and similar soils: 2 percent of the unit
Crago, stony, and similar soils: 1 percent of the unit
Pensore and similar soils: 1 percent of the unit

Management

- For information about managing this map unit, see the appropriate sections in Part II of this publication.

3486F—Peeler-Rock outcrop complex, 15 to 60 percent slopes

Map Unit Setting

Landscape: Mountains
Elevation: 5,000 to 6,000 feet
Mean annual precipitation: 20 to 28 inches
Frost-free period: 50 to 70 days

Component Description

Peeler and similar soils

Extent: 80 percent of the map unit
Geomorphic position: Alluvial fans, mountain slopes, ridges
Slope: 15 to 60 percent
Surface layer texture: Bouldery sandy loam
Restrictive feature: None noted
Drainage class: Well drained

Parent material: Fine-loamy slope alluvium derived from granite over sandy and gravelly residuum derived from granite
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 6.8 inches

Rock outcrop

Extent: 10 percent of the map unit
Definition: This component consists mainly of exposed areas of hard, coarse grained granite bedrock. In places, a thin layer of decomposing granite (grus) covers the bedrock. Large, rounded boulders of granite are in the vicinity of the outcrops.

Additional Components

Franconi and similar soils: 4 percent of the unit
Lowder and similar soils: 2 percent of the unit
Peeler, stony, and similar soils: 2 percent of the unit
Rubble land: 2 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

3501B—Fluvaquents-Fluvaquentic Haplustolls complex, 0 to 4 percent slopes

Map Unit Setting

Landscape: River valleys, valleys
Elevation: 3,600 to 4,500 feet
Mean annual precipitation: 10 to 19 inches
Frost-free period: 90 to 120 days

Component Description

Fluvaquents and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps
Slope: 0 to 4 percent
Surface layer texture: Silt loam
Restrictive feature: None noted
Drainage class: Poorly drained
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 9.2 inches

Fluvaquentic Haplustolls and similar soils

Extent: 40 percent of the map unit
Geomorphic position: Drainageways, flood plains, flood-plain steps, terraces
Slope: 0 to 4 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Somewhat poorly drained
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Frequency of flooding: Rare
Water table: Within a depth of 60 inches
Available water capacity: Mainly 6.7 inches

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

3513A—Attewan-Nippt complex, 0 to 2 percent slopes

Map Unit Setting

Landscape: Valleys
Elevation: 3,600 to 4,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 120 days

Component Description

Attewan and similar soils

Extent: 60 percent of the map unit
Geomorphic position: Plains, stream terraces
Slope: 0 to 2 percent
Surface layer texture: Loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Nippt and similar soils

Extent: 30 percent of the map unit
Geomorphic position: Flood-plain steps, terraces
Slope: 0 to 2 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material: Gravelly alluvium over calcareous sandy and gravelly alluvium derived from fine grained igneous, sedimentary, and metamorphic rocks
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 2.3 inches

Additional Components

Nippt, very cobbly, and similar soils: 5 percent of the unit
Nippt, very gravelly, and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

3532B—Geohrock gravelly loam, 2 to 8 percent slopes

Map Unit Setting

Landscape: Valleys, uplands
Elevation: 3,600 to 4,500 feet
Mean annual precipitation: 10 to 14 inches
Frost-free period: 105 to 120 days

Component Description

Geohrock and similar soils

Extent: 85 percent of the map unit
Geomorphic position: Alluvial fans, terraces, valley floors
Slope: 2 to 8 percent
Surface layer texture: Gravelly loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly Tertiary valley fill alluvium
Gravelly slope alluvium
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 3.7 inches

Additional Components

Crago and similar soils: 5 percent of the unit
Geohrock soils that have slopes of more than 8 percent: 5 percent of the unit
Nippt and similar soils: 5 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

3664E—Windham-Whitecow-Lap channery loams, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 5,000 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 110 days

Component Description

Windham and similar soils

Extent: 45 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Channery loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 4.6 inches

Whitecow and similar soils

Extent: 35 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Channery loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.0 inches

Lap and similar soils

Extent: 15 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly colluvium over residuum derived from limestone
Gravelly residuum derived from limestone
Native plant cover type: Rangeland
Flooding: None
Available water capacity: Mainly 1.3 inches

Additional Components

Lap, very shallow, and similar soils: 2 percent of the unit
Whitecow soils that have slopes of more than 45 percent: 2 percent of the unit
Maiden and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

3685F—Whitecow channery loam, 25 to 60 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,500 to 5,000 feet
Mean annual precipitation: 12 to 19 inches
Frost-free period: 90 to 115 days

Component Description

Whitecow and similar soils

Extent: 95 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 25 to 60 percent
Surface layer texture: Channery loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.0 inches

Additional Components

Rock outcrop: 2 percent of the unit
Whitecow soils that have slopes of more than 60 percent: 2 percent of the unit
Maiden and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

3885F—Whitecow-Warneke channery loams, 15 to 45 percent slopes

Map Unit Setting

Landscape: Foothills, uplands
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 15 to 19 inches
Frost-free period: 90 to 110 days

Component Description

Whitecow and similar soils

Extent: 70 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Channery loam
Restrictive feature: None noted
Drainage class: Well drained
Parent material:
Gravelly colluvium derived from limestone
Gravelly slope alluvium derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 4.0 inches

Warneke and similar soils

Extent: 20 percent of the map unit
Geomorphic position: Divides, escarpments, hillsides, ridges
Slope: 15 to 45 percent
Surface layer texture: Channery loam
Depth to restrictive feature: 10 to 20 inches to bedrock (lithic)
Drainage class: Well drained
Parent material:
Gravelly residuum derived from limestone
Gravelly slope alluvium derived from limestone over residuum derived from limestone
Native plant cover type: Forest land
Flooding: None
Available water capacity: Mainly 1.1 inches

Additional Components

Maiden, very gravelly, and similar soils: 6 percent of the unit
Whitecow soils that have slopes of more than 45 percent: 3 percent of the unit
Maiden and similar soils: 1 percent of the unit

Management

• For information about managing this map unit, see the appropriate sections in Part II of this publication.

DAM—Dam

Description

Extent: 100 percent of the map unit
Definition: A barrier constructed across a waterway for

the purpose of controlling the flow or raising the level of the water

M-W—Miscellaneous water

Description

Extent: 100 percent of the map unit
Definition: Areas of sewage lagoons, industrial water pits, fish hatcheries, etc.

W—Water

Description

Extent: 100 percent of the map unit
Definition: Streams, lakes, ponds, and reservoirs that in most years contain water at least during the period when the weather is warm enough for the growth of plants. Many areas contain water throughout the year.

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Glossary

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. See Sodic (alkali) soil.

Alluvial fan. A body of alluvium, with overflow of water and debris flow deposits, whose surface forms a segment of a cone that radiates downslope from the point where the stream emerges from a narrow valley onto a less sloping surface. Source uplands range in relief and area extent from mountains to gullied terrains on hillslopes.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillite. Weakly metamorphosed mudstone or shale.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3.75
Low	3.75 to 5.0
Moderate	5.0 to 7.5
High	more than 7.5

Avalanche chute. The track or path formed by an avalanche.

Backslope. The geomorphic component that forms the steepest inclined surface and principal element of many hillslopes. Backslopes in profile are commonly steep and linear and descend to a footslope. In terms of gradational process, backslopes are erosional forms produced mainly by mass wasting and running water.

Badland. Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding planes. Fine strata, less than 5 millimeters

thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-floored plain. An extensive nearly level to gently rolling or moderately sloping area that is underlain by hard bedrock and has a slope of 0 to 8 percent.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Board foot. A unit of measure of the wood in lumber, logs, or trees. The amount of wood in a board 1 foot wide, 1 foot long, and 1 inch thick before finishing.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Bouldery. Refers to a soil in an area where 0.01 to 0.1 percent of the surface is covered with boulders.

Bouldery soil material. Soil that is 15 to 35 percent, by volume, rock fragments that are dominantly larger than 24 inches (60 centimeters) in diameter.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche. A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds directly beneath the solum, or it is exposed at the surface by erosion.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channeled. Refers to a drainage area in which natural meandering or repeated branching and convergence of a streambed have created deeply incised cuts, either active or abandoned, in alluvial material.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Cirque. A semicircular, concave, bowllike area that has steep faces primarily resulting from glacial ice and snow abrasion.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Clearcut. A method of forest harvesting that removes the entire stand of trees in one cutting. Reproduction is achieved artificially or by natural seeding from the adjacent stands.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Closed depression. A low area completely surrounded by higher ground and having no natural outlet.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Codominant trees. Trees whose crowns form the general level of the forest canopy and that receive full light from above but comparatively little from the sides.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Commercial forest. Forestland capable of producing 20 cubic feet or more per acre per year at the culmination of the mean annual increment.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conglomerate. A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the "Soil Survey Manual."

Consolidated sandstone. Sandstone that disperses within a few hours when fragments are placed in water. The fragments are extremely hard or very hard when dry, are not easily crushed, and cannot be textured by the usual field method.

Consolidated shale. Shale that disperses within a few hours when fragments are placed in water. The fragments are extremely hard or very hard when dry and are not easily crushed.

Contour stripcropping. Growing crops in strips that

follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Dip slope. A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming. A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Dominant trees. Trees whose crowns form the general level of the forest canopy and that receive full light from above and from the sides.

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainageway. An area of ground at a lower elevation than the surrounding ground and in which water collects and is drained to a closed depression or lake or to a drainageway at a lower elevation. A drainageway may or may not have distinctly incised channels at its upper reaches or throughout its course.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Dune. A mound, ridge, or hill of loose, windblown granular material (generally sand), either bare or covered with vegetation.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the

product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Esker. A long, narrow, sinuous, steep-sided ridge composed of irregularly stratified sand and gravel that were deposited by a subsurface stream flowing between ice walls or through ice tunnels of a retreating glacier and that were left behind when the ice melted. Eskers range from less than a mile to more than 100 miles in length and from 10 to 100 feet in height.

Even aged. Refers to a stand of trees in which only small differences in age occur between individual trees. A range of 20 years is allowed.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foothill. A steeply sloping upland that has relief of as

much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

Footslope. The geomorphic component that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. In terms of gradational processes, a footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Giant ripple mark. The undulating surface sculpture produced in noncoherent granular materials by currents of water and by the agitation of water in wave action during the drainage of large glacial lakes, such as Glacial Lake Missoula.

Glacial drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciated uplands. Land areas that were previously covered by continental or alpine glaciers and that are at a higher elevation than the flood plain.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter. Very gravelly soil is 35 to 60 percent gravel, and extremely gravelly soil is more than 60 percent gravel.

Grazeable forestland. Land capable of sustaining livestock grazing by producing forage of sufficient quantity during one or more stages of secondary forest succession.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Grus. The fragmental products of in-situ granular disintegration of granite and granitic rocks.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Gypsum. A mineral consisting of hydrous calcium sulfate.

Habitat type. An aggregation of all land areas capable of producing similar climax plant communities.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head out. To form a flower head.

Head slope. A geomorphic component of hills

consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Heavy metal. Inorganic substances that are solid at ordinary temperatures and are not soluble in water. They form oxides and hydroxides that are basic. Examples are copper, iron, cadmium, zinc, manganese, lead, and arsenic.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be

limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame. An irregular, short ridge or hill of stratified glacial drift.

Kame terrace. A terracelike ridge consisting of stratified sand and gravel that were deposited by a meltwater stream flowing between a melting glacier and a higher valley wall or lateral moraine and that remained after the disappearance of the ice. It is commonly pitted with kettles and has an irregular ice-contact slope.

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain. A surface marking the floor of an extinct lake, filled in by well sorted, stratified sediments.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Lateral moraine. A ridgelike moraine carried on and deposited at the side margin of a valley glacier. It is composed chiefly of rock fragments derived from the valley walls by glacial abrasion and plucking or by mass wasting.

Leaching. The removal of soluble material from soil or other material by percolating water.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.
Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.
Loamy soil. Coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, or silty clay loam.
Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.
Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.
Low strength. The soil is not strong enough to support loads.
Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.
Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.
Mean annual increment (MAI). The average annual increase in volume of a tree during its entire life.
Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.
Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.
Merchantable trees. Trees that are of sufficient size to be economically processed into wood products.
Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.
Microhigh. An area that is 2 to 12 inches higher than the adjacent microlow.
Microlow. An area that is 2 to 12 inches lower than the adjacent microhigh.
Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.
Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.
Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.
Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.
Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.
Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.
Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.
Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.
Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.
Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)
Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.
Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.
Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.
Naturalized pasture. Forestland that is used primarily for the production of forage for grazing by livestock rather than for wood products. Overstory trees are removed or managed in a way that promotes the native and introduced understory vegetation on the site. This vegetation is managed for its forage value through the application of grazing management principles.
Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)
Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.
Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium,

magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Overstory. The trees in a forest that form the upper crown cover.

Oxbow. The horseshoe-shaped channel of a former meander, remaining after the stream formed a cutoff across a narrow meander neck.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable	less than 0.0015 inch
Very slow	0.0015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Playa. The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential natural community (PNC). The biotic community that would become established on an ecological site if all successional sequences were completed without interference by human activities under the present environmental conditions. Natural disturbances are inherent in its development. The PNC may include acclimatized or naturalized nonnative species.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Quartzite, metamorphic. Rock consisting mainly of quartz that formed through recrystallization of quartz-rich sandstone or chert.

Quartzite, sedimentary. Very hard but unmetamorphosed sandstone consisting chiefly of quartz grains.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. (See Similarity index.)

Range site. See Ecological site.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Recessional moraine. A moraine formed during a temporary but significant halt in the retreat of a glacier.

Red beds. Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redox concentrations. See Redoximorphic concentrations.

Redox depletions. See Redoximorphic depletions.

Redox features. See Redoximorphic features.

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regeneration. The new growth of a natural plant community, developing from seed.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relict stream terrace. One of a series of platforms in or adjacent to a stream valley that formed prior to the current stream system.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Riser. The relatively short, steeply sloping area below a terrace tread that grades to a lower terrace tread or base level.

Road cut. A sloping surface produced by mechanical

means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Salinity. The electrical conductivity of a saline soil. It is expressed, in millimhos per centimeter, as follows:

Nonsaline	0 to 4
Slightly saline	4 to 8
Moderately saline	8 to 16
Strongly saline	more than 16

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sandy soil. Sand or loamy sand.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Sawlogs. Logs of suitable size and quality for the production of lumber.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Scribner's log rule. A method of estimating the number of board feet that can be cut from a log of a given diameter and length.

Sedimentary plain. An extensive nearly level to gently rolling or moderately sloping area that is underlain by sedimentary bedrock and that has a slope of 0 to 8 percent.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Sedimentary uplands. Land areas of bedrock formed from water- or wind-deposited sediments. They are higher on the landscape than the flood plain.

Semiconsolidated sedimentary beds. Soft geologic sediments that disperse when fragments are placed in water. The fragments are hard or very hard when dry. Determining the texture by the usual field method is difficult.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner,

and have similar conservation needs or management requirements for the major land uses in the survey area.

Similarity index. The percentage of a specific vegetation-state plant community that is presently on the site.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Skid trails. Pathways along which logs are dragged to a common site for loading onto a logging truck.

Slash. The branches, bark, treetops, reject logs, and broken or uprooted trees left on the ground after logging.

Slickens. Accumulations of fine textured material, such as that separated in placer-mine and ore-mill operations. Slickens from ore mills consist largely of freshly ground rock that commonly has undergone chemical treatment during the milling process. Slickens are commonly confined in a specially constructed basin.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey the following slope classes are recognized:

Nearly level	0 to 2 percent
Gently sloping	2 to 4 percent
Moderately sloping	4 to 8 percent
Strongly sloping	8 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 to 45 percent
Very steep	more than 45 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specified use.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to $Ca^{++} + Mg^{++}$. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Sodium adsorption ratio (SAR). A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage. In an area of stony soil, stones cover 0.01 to 0.1 percent of the surface. Very stony means that stones cover 0.1 to

3.0 percent of the surface, and extremely stony means that stones cover 3 to 15 percent of the surface.

Strath terrace. A type of stream terrace, formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

Stream channel. The hollow bed where a natural stream of surface water flows or may flow; the deepest or central part of the bed, formed by the main current and covered more or less continuously by water.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Tailwater. The water directly downstream from a structure.

Talus. Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Terracette. A small, irregular, steplike form on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may or may not be induced by trampling of livestock.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Till plain. An extensive nearly level to gently rolling or moderately sloping area that is underlain by or consists of till and that has a slope of 0 to 8 percent.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a

hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Trafficability. The degree to which a soil is capable of supporting vehicular traffic across a wide range in soil moisture conditions.

Tread. The relatively flat terrace surface that was cut or built by stream or wave action.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Understory. Any plants in a forest community that grow to a height of less than 5 feet.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley. An elongated depressional area primarily developed by stream action.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

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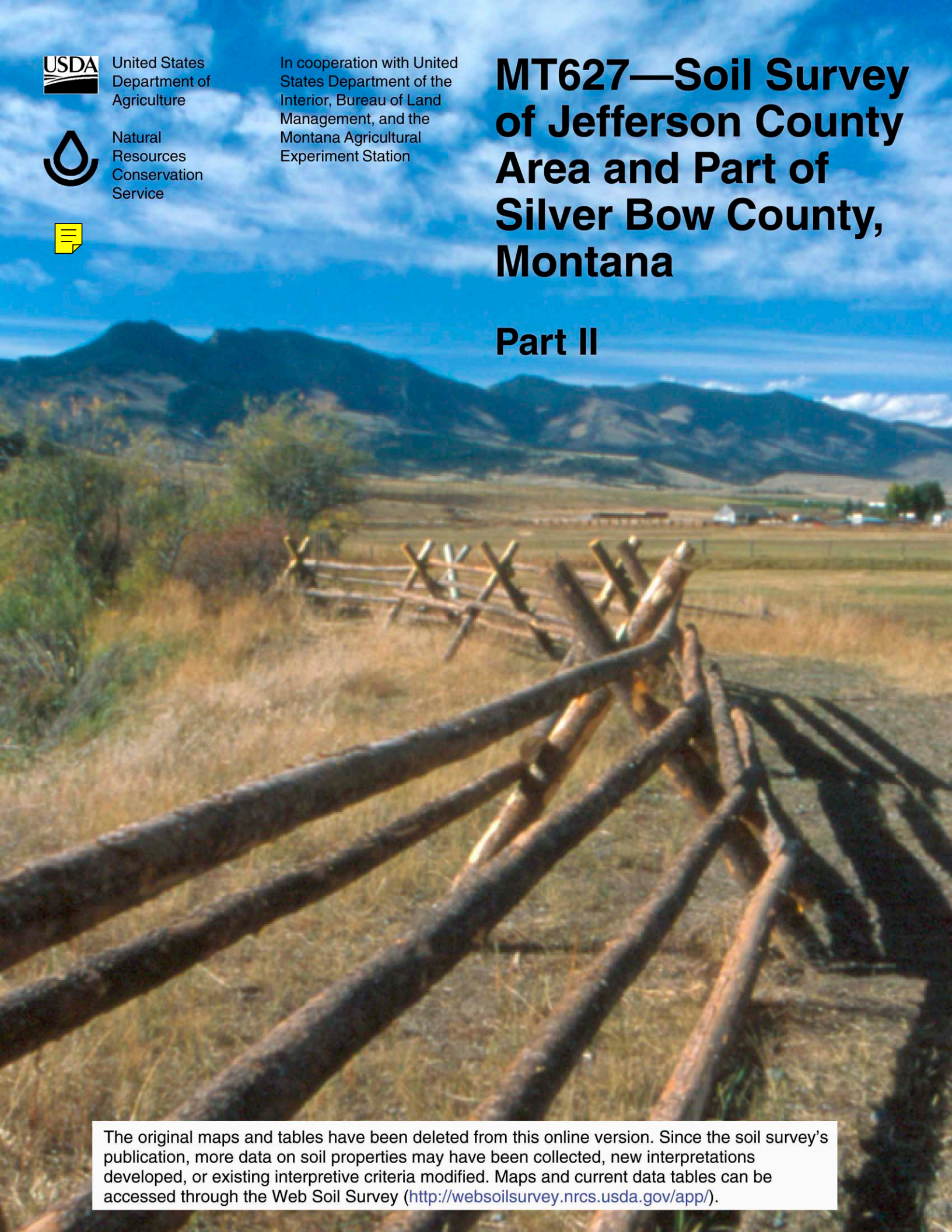
United States Department of Agriculture

Natural Resources Conservation Service

In cooperation with United States Department of the Interior, Bureau of Land Management, and the Montana Agricultural Experiment Station

MT627—Soil Survey of Jefferson County Area and Part of Silver Bow County, Montana

Part II



The original maps and tables have been deleted from this online version. Since the soil survey's publication, more data on soil properties may have been collected, new interpretations developed, or existing interpretive criteria modified. Maps and current data tables can be accessed through the Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/).

How to Use This Soil Survey

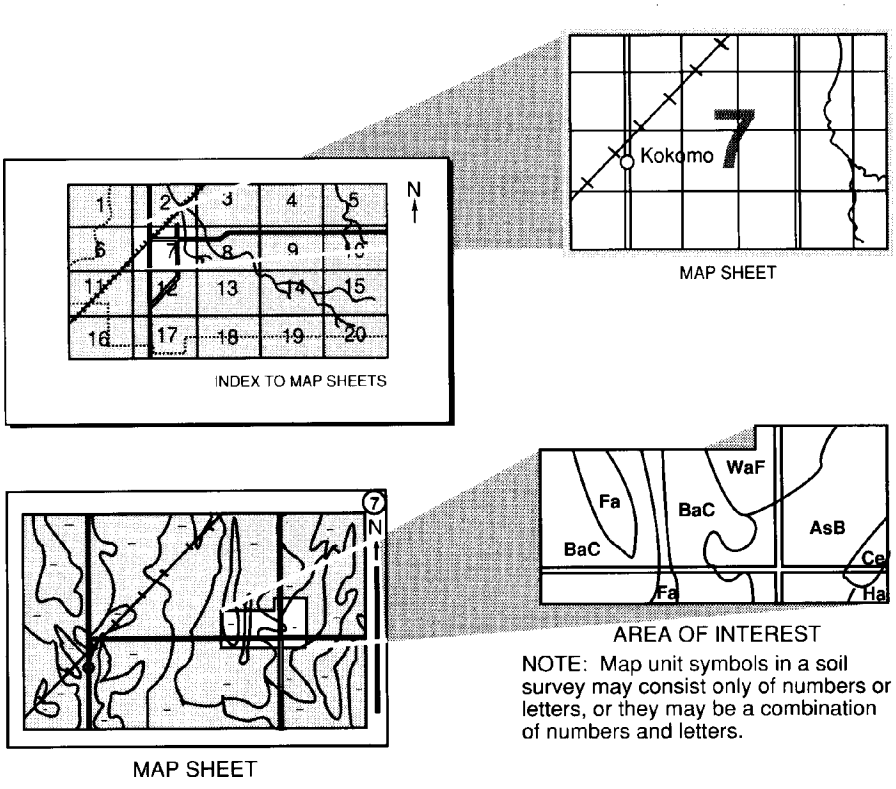
Detailed Soil Maps

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, you can locate the Section, Township, and Range by zooming in on the **Index to Map Sheets**, or you can go to the Web Soil Survey at (http://websoilsurvey.nrcs.usda.gov/app/).

Note the map unit symbols that are in that area. The **Contents** lists the map units by symbol and name and shows the page where each map unit is described.

See the Contents for sections of this publication that may address your specific needs.



This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1996. Soil names and descriptions were approved in 1998. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1998. This survey was made cooperatively by the Natural Resources Conservation Service; the United States Department of the Interior, Bureau of Land Management; and the Montana Agricultural Experiment Station. It is part of the technical assistance furnished to the Jefferson Valley Conservation District and the Mile High Conservation District.

The most current official data are available through the NRCS Soil Data Mart website at http://soildatamart.nrcs.usda.gov. Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

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Cover: A view of the Boulder River valley. Wetsand soils are in the foreground, and Bull Mountain is in the background.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at http://www.nrcs.usda.gov.

Contents

How To Use This Soil Survey 3
Detailed Soil Map Unit Legend 6
Introduction to Part II 23
Agronomy 51
Crops and Pasture 51
Cropland Limitations and Hazards 51
Crop Yield Estimates 53
Land Capability Classification 53
Important Farmland 54
Erosion Factors 55
Rangeland 313
Forest Land 545
Forest Land Productivity 545
Forest Access Roads 545
General Land Management 629
Engineering 695
Building Site Development 695
Waste Management 696
Construction Materials 696
Water Management 697
Soil Properties 1087
Engineering Index Properties 1087
Physical Properties 1088
Chemical Properties 1089
Water Features 1090
Soil Features 1091
References 2023
Glossary 2025

Issued 2003

For tables with the most current data, please visit the Soil Data Mart at **http://soildatamart.nrcs.usda.gov/.**

Detailed Soil Map Unit Legend

1—Riverwash
2—Rubble land-Rock outcrop association
3—Dumps, mine
4—Bronec, Clunton, channeled, and Amesha soils, 0 to 8 percent slopes
5—Borrow areas and gravel pits
6—Wetsand, Cardwell, and Clunton soils, 0 to 2 percent slopes, channeled
9—Bronec, Riverrun, channeled, and Amesha soils, 0 to 8 percent slopes
11B—Amesha silt loam, 1 to 4 percent slopes
11C—Amesha silt loam, 4 to 8 percent slopes
11D—Amesha silt loam, 8 to 15 percent slopes
13A—Anamac loam, 0 to 2 percent slopes
13C—Anamac loam, 2 to 8 percent slopes
18A—Brocko silt loam, 0 to 2 percent slopes
18C—Brocko silt loam, 2 to 8 percent slopes
18D—Brocko silt loam, 8 to 15 percent slopes
18E—Brocko silt loam, 15 to 35 percent slopes
20C—Windham gravelly loam, 2 to 8 percent slopes
20D—Windham gravelly loam, 8 to 15 percent slopes
20E—Windham very gravelly loam, 15 to 35 percent slopes
21A—Mckenton silty clay loam, 0 to 2 percent slopes
22C—Zatony clay loam, 2 to 8 percent slopes
23A—Mckenton silt loam, 0 to 2 percent slopes
25C—Cozberg sandy loam, 2 to 8 percent slopes
26C—Crago gravelly loam, 2 to 8 percent slopes
26D—Crago gravelly loam, 8 to 15 percent slopes
26E—Crago gravelly loam, 15 to 25 percent slopes
27A—Bronec gravelly loam, 0 to 2 percent slopes
27C—Bronec gravelly loam, 2 to 8 percent slopes
27D—Bronec gravelly loam, 8 to 15 percent slopes
27E—Bronec gravelly loam, 15 to 35 percent slopes
30A—Dougcliff mucky peat, 0 to 1 percent slopes
32A—Fairway silt loam, 0 to 2 percent slopes
33E—Geohrock cobbly clay loam, 15 to 35 percent slopes, stony
37A—Pieriver silt loam, 0 to 2 percent slopes
38C—Kalsted sandy loam, 2 to 8 percent slopes
38D—Kalsted sandy loam, 8 to 15 percent slopes
40A—Moltoner loam, 0 to 2 percent slopes
41—Bronec, Amesha, and Riverrun, channeled, soils, 0 to 35 percent slopes
42D—Perma cobbly loam, 4 to 15 percent slopes, stony
42E—Perma cobbly loam, 15 to 25 percent slopes, stony
47A—Cardwell silty clay loam, 0 to 2 percent slopes
48A—Riverrun sandy loam, 0 to 2 percent slopes
52A—Ryell loam, 0 to 2 percent slopes
53C—Sappington gravelly clay loam, 2 to 8 percent slopes
56A—Trudau loam, 0 to 2 percent slopes
56B—Trudau loam, 2 to 8 percent slopes
60C—Watne loam, 2 to 8 percent slopes
64A—Varney sandy clay loam, 0 to 2 percent slopes
64C—Varney sandy clay loam, 2 to 8 percent slopes
65C—Judell loam, 2 to 8 percent slopes
68D—Bondoe channery loam, 4 to 15 percent slopes
69A—Meadowcreek silty clay loam, 0 to 2 percent slopes
71C—Raghorn sandy loam, 4 to 8 percent slopes
71D—Raghorn sandy loam, 8 to 15 percent slopes
72F—Zbart-Rock outcrop association, 25 to 70 percent slopes
73C—Martinsdale loam, 2 to 8 percent slopes
74D—Shawmut gravelly loam, 4 to 15 percent slopes, bouldery
75C—Sixbeacon loam, 2 to 8 percent slopes
76A—Absay silty clay loam, 0 to 4 percent slopes
77F—Rock outcrop-Pensore, stony-Crago, stony, association, 25 to 60 percent slopes
79A—Chinook sandy loam, 0 to 2 percent slopes
79C—Chinook sandy loam, 2 to 8 percent slopes
79D—Chinook sandy loam, 8 to 15 percent slopes
79E—Chinook sandy loam, 15 to 25 percent slopes
80A—Floweree silt loam, 0 to 2 percent slopes
80C—Floweree silt loam, 2 to 8 percent slopes
81A—Ethridge clay loam, 0 to 2 percent slopes
81C—Ethridge clay loam, 2 to 8 percent slopes
82C—Rothiemay very gravelly loam, 2 to 8 percent slopes
83C—Shoddy silty clay loam, 2 to 8 percent slopes
83D—Shoddy silty clay loam, 8 to 15 percent slopes
84A—Clunton-Faith-Dougcliff complex, 1 to 4 percent slopes
85D—Walbert coarse sandy loam, 4 to 15 percent slopes

87C—Kobarter clay loam, 2 to 8 percent slopes
87D—Kobarter clay loam, 8 to 15 percent slopes
88C—Lahood loam, 2 to 8 percent slopes
88D—Lahood loam, 8 to 15 percent slopes
92D—Clunton, Cometcrik, and Perma, stony, soils, 0 to 15 percent slopes
99D—Libeg gravelly loam, 4 to 15 percent slopes, bouldery
99E—Libeg very gravelly loam, 15 to 35 percent slopes, bouldery
113C—Amesha-Amesha, stony, complex, 2 to 8 percent slopes
113D—Amesha-Amesha, stony, complex, 8 to 15 percent slopes
114D—Amesha-Crago-Shoddy complex, 4 to 15 percent slopes
114E—Amesha-Crago-Shoddy complex, 15 to 45 percent slopes
115A—Amesha gravelly loam, 0 to 2 percent slopes
115C—Amesha gravelly loam, 2 to 8 percent slopes
115D—Amesha gravelly loam, 8 to 15 percent slopes
115E—Amesha gravelly loam, 15 to 35 percent slopes
116A—Amesha loam, 0 to 2 percent slopes
116C—Amesha loam, 2 to 8 percent slopes
116D—Amesha loam, 8 to 15 percent slopes
117E—Amesha-Cabbart-Bronec cobbly loams, 4 to 25 percent slopes
118C—Amesha cobbly loam, 2 to 8 percent slopes
121E—Maiden-Lap-Rock outcrop complex, 15 to 35 percent slopes
121F—Maiden-Lap-Rock outcrop complex, 35 to 60 percent slopes
122D—Maiden-Lap-Windham complex, 4 to 15 percent slopes
122E—Maiden-Lap-Windham complex, 15 to 35 percent slopes
122F—Maiden-Lap-Windham complex, 35 to 60 percent slopes
123E—Maiden, very stony-Rock outcrop-Lap, very stony, complex, 8 to 35 percent slopes
123F—Maiden, very stony-Rock outcrop-Lap, very stony, complex, 35 to 60 percent slopes
125D—Maiden-Lap-Windham complex, 4 to 15 percent slopes, warm
125E—Maiden-Lap-Windham complex, 15 to 35 percent slopes, warm
126F—Maiden, very stony-Rock outcrop-Lap, very stony, complex, 35 to 60 percent slopes, warm
132A—Anamac silt loam, 0 to 2 percent slopes, saline
151D—Delpoint-Abor complex, 4 to 15 percent slopes
171D—Branham-Opitz-Tuggle complex, 2 to 15 percent slopes
171E—Branham-Opitz-Tuggle complex, 15 to 35 percent slopes
172D—Branham-Clugulch-Rock outcrop complex, 2 to 15 percent slopes
172E—Branham-Clugulch-Rock outcrop complex, 15 to 35 percent slopes
173F—Branham, stony-Tuggle, very stony-Rock outcrop complex, 35 to 60 percent slopes
182D—Brocko-Amesha complex, 4 to 15 percent slopes
183E—Brocko-Rock outcrop-Rencot complex, 8 to 35 percent slopes
184E—Brocko-Rock outcrop-Bronec, very stony, complex, 15 to 45 percent slopes
191C—Cabbart-Shoddy-Amesha complex, 2 to 8 percent slopes
191D—Cabbart-Shoddy-Amesha complex, 8 to 15 percent slopes
191E—Cabbart-Shoddy-Amesha complex, 15 to 45 percent slopes
192C—Cabbart clay loam, 2 to 8 percent slopes
193E—Cabbart-Haxby loams, 8 to 45 percent slopes
194E—Cabbart-Bronec, stony-Rencot, very stony, complex, 8 to 25 percent slopes
195E—Cabbart, very stony-Bronec, stony-Rock outcrop complex, 8 to 35 percent slopes
195F—Cabbart, very stony-Rock outcrop-Bronec, very stony, complex, 25 to 60 percent slopes
201E—Windham-Rock outcrop-Lap, very stony, complex, 8 to 35 percent slopes
201F—Windham, very stony-Rock outcrop-Lap, very stony, complex, 35 to 70 percent slopes
202D—Windham-Judell complex, 8 to 15 percent slopes
202E—Windham-Judell complex, 15 to 35 percent slopes

203D—Windham gravelly loam, 4 to 15 percent slopes, stony
203E—Windham gravelly loam, 15 to 35 percent slopes, stony
204D—Windham-Maiden-Lap complex, 4 to 15 percent slopes
204E—Windham, stony-Maiden, very stony-Lap, very stony, complex, 15 to 35 percent slopes
204F—Windham, very stony-Maiden, very stony-Rock outcrop complex, 25 to 60 percent slopes
205E—Windham very cobbly loam, 4 to 35 percent slopes, very stony
205F—Windham very cobbly loam, 35 to 60 percent slopes, very stony
206F—Windham-Windham, stony, complex, 35 to 70 percent slopes
207E—Windham, stony-Lap, very stony-Rock outcrop complex, 15 to 35 percent slopes
207F—Windham, stony-Lap, very stony-Rock outcrop complex, 35 to 70 percent slopes
208D—Windham-Judell gravelly loams, 8 to 25 percent slopes, stony
211A—Clunton silty clay loam, 0 to 2 percent slopes
221A—Zatony clay loam, 0 to 2 percent slopes, wet
231A—Ledger-Moltoner-Mckenton complex, 0 to 2 percent slopes
232A—Clunton-Wetsand-Bonebasin complex, 0 to 2 percent slopes
233A—Ledger-Wetsand, saline, complex, 0 to 2 percent slopes
241E—Whitlash, very stony-Rock outcrop-Perma, stony, complex, 2 to 25 percent slopes
241F—Whitlash, very stony-Rock outcrop-Perma, very stony, complex, 25 to 60 percent slopes
245E—Tolbert, very stony-Rock outcrop-Absarook, stony, complex, 8 to 35 percent slopes
251B—Cozberg sandy loam, 1 to 4 percent slopes, stony
251D—Cozberg sandy loam, 4 to 15 percent slopes, stony
261D—Crago-Brocko complex, 4 to 15 percent slopes
261E—Crago-Brocko complex, 15 to 60 percent slopes
263D—Crago-Rock outcrop-Pensore complex, 4 to 25 percent slopes
263F—Crago, stony-Rock outcrop-Pensore, stony, complex, 25 to 60 percent slopes
264C—Crago-Amesha complex, 2 to 8 percent slopes
264D—Crago-Amesha complex, 8 to 15 percent slopes
264E—Crago-Amesha complex, 15 to 35 percent slopes
264F—Crago-Amesha complex, 35 to 60 percent slopes
265B—Crago gravelly loam, 1 to 4 percent slopes, stony
265D—Crago gravelly loam, 4 to 15 percent slopes, stony
265E—Crago very cobbly loam, 15 to 45 percent slopes, very stony
266D—Crago, stony-Crago complex, 4 to 15 percent slopes
266E—Crago, stony-Crago complex, 15 to 45 percent slopes
267F—Crago, very stony-Pensore, stony-Rock outcrop complex, 25 to 60 percent slopes
268C—Crago-Amesha cobbly loams, 2 to 8 percent slopes
269D—Crago, very stony, and Crago, rubbly, soils, 2 to 15 percent slopes
271C—Bronec-Amesha complex, 2 to 8 percent slopes
271D—Bronec-Amesha complex, 8 to 15 percent slopes
271E—Bronec-Amesha complex, 15 to 35 percent slopes
271F—Bronec-Amesha-Rock outcrop complex, 35 to 60 percent slopes
272E—Bronec-Geohrock-Rock outcrop complex, 15 to 45 percent slopes
273D—Bronec-Shoddy-Amesha complex, 4 to 15 percent slopes
273E—Bronec-Shoddy-Amesha complex, 15 to 35 percent slopes
274A—Bronec complex, 0 to 2 percent slopes
274C—Bronec complex, 2 to 8 percent slopes
274D—Bronec complex, 8 to 15 percent slopes
274E—Bronec-Bronec, very stony, complex, 15 to 45 percent slopes

275A—Bronec gravelly loam, 1 to 4 percent slopes, stony
275D—Bronec very gravelly loam, 4 to 15 percent slopes, very stony
275E—Bronec very gravelly loam, 15 to 35 percent slopes, very stony
276C—Bronec gravelly loam, 2 to 8 percent slopes, saline
277C—Bronec-Amesha cobbly loams, 2 to 8 percent slopes
278E—Bronec-Rencot-Rock outcrop complex, 15 to 45 percent slopes
291C—Sieben complex, 2 to 8 percent slopes
292C—Sieben-Varney cobbly loams, 2 to 8 percent slopes
293D—Sieben cobbly loam, 4 to 15 percent slopes, stony
294C—Sieben, stony-Sieberell, very stony, complex, 2 to 15 percent slopes
295D—Sieben cobbly loam, 4 to 15 percent slopes, bouldery
296D—Sieberell-Sieben-Beaverell complex, 4 to 15 percent slopes, stony
297D—Sieben, very stony-Sieben, rubbly, complex, 2 to 25 percent slopes
297F—Sieben, rubbly-Sieben, very stony, complex, 15 to 60 percent slopes
311D—Beenom, stony-Wimper-Whitlash, very stony, complex, 4 to 15 percent slopes
311F—Beenom, stony-Wimper-Whitlash, very stony, complex, 15 to 45 percent slopes
321A—Fairway-Meadowcreek complex, 0 to 2 percent slopes
322A—Fairway loam, 0 to 2 percent slopes
323A—Fairway-Mckenton silt loams, 0 to 2 percent slopes
324A—Fairway clay loam, 0 to 2 percent slopes
325A—Fairway-Nestley clay loams, 0 to 2 percent slopes
326A—Fairway-Moltoner complex, 0 to 2 percent slopes
327A—Faith loam, 0 to 2 percent slopes
328A—Faith loam, 0 to 2 percent slopes, cool
329C—Faith-Slickens complex, 0 to 8 percent slopes, impacted
331C—Geohrock-Bronec gravelly loams, 2 to 8 percent slopes
331D—Geohrock-Bronec gravelly loams, 8 to 15 percent slopes
332D—Geohrock-Sappington complex, 4 to 15 percent slopes, stony
334D—Geohrock, stony-Bronec, very stony, complex, 4 to 15 percent slopes
341A—Pieriver-Cardwell-Riverrun loams, 0 to 2 percent slopes
342A—Handke fine sandy loam, 0 to 2 percent slopes
361D—Udecide-Varney-Walbert complex, 4 to 25 percent slopes
362C—Udecide-Varney sandy clay loams, 2 to 8 percent slopes
371A—Havre-Ryell-Handke complex, 0 to 2 percent slopes
372A—Havre loam, 0 to 2 percent slopes
381C—Kalsted gravelly sandy loam, 2 to 8 percent slopes
382D—Kalsted gravelly sandy loam, 4 to 15 percent slopes, stony
391C—Musselshell-Crago gravelly loams, 2 to 8 percent slopes
394B—Musselshell-Crago cobbly loams, 1 to 4 percent slopes
401A—Moltoner silty clay loam, 0 to 2 percent slopes
411A—Nestley loam, 0 to 2 percent slopes
413A—Nestley-Riverrun-Pieriver complex, 0 to 2 percent slopes
421E—Perma, stony-Whitlash, very stony, complex, 15 to 35 percent slopes
421F—Perma-Whitlash complex, 35 to 60 percent slopes, very stony
422F—Perma, very stony-Whitlash, very stony-Rock outcrop complex, 15 to 45 percent slopes, moist
423C—Wimper loam, 2 to 8 percent slopes
423D—Wimper loam, 8 to 15 percent slopes
423E—Wimper loam, 15 to 35 percent slopes
424D—Wimper-Wimper, stony, complex, 4 to 15 percent slopes
424E—Wimper-Wimper, stony, complex, 15 to 35 percent slopes
425E—Wimper gravelly loam, 8 to 35 percent slopes, stony

426F—Wimper-Whitlash association, 35 to 60 percent slopes
427E—Perma-Whitlash complex, 15 to 35 percent slopes, bouldery
429E—Perma, very stony-Perma, rubbly-Rock outcrop complex, 8 to 35 percent slopes
441F—Warneke-Warneke, very stony-Rock outcrop association, 8 to 60 percent slopes
451A—Geohrock cobbly clay loam, 1 to 4 percent slopes, stony
461D—Absarook-Beenom complex, 2 to 15 percent slopes
471A—Cardwell-Pieriver complex, 0 to 2 percent slopes
481A—Riverrun gravelly sandy loam, 0 to 2 percent slopes
482A—Riverrun-Cardwell complex, 0 to 2 percent slopes
483A—Riverrun, Handke, and Ryell soils, 0 to 2 percent slopes, channeled
492D—Roto-Pensore-Crago complex, 4 to 15 percent slopes
492E—Roto-Pensore-Crago complex, 15 to 35 percent slopes
492F—Roto-Pensore-Crago complex, 35 to 60 percent slopes, stony
493D—Pensore-Rock outcrop-Roto complex, 2 to 25 percent slopes
511C—Haxby-Amesha-Rencot complex, 4 to 15 percent slopes
521A—Cardwell-Riverrun complex, 0 to 2 percent slopes
522A—Ryell-Riverrun complex, 0 to 2 percent slopes
523A—Cardwell-Riverrun-Pieriver complex, 0 to 2 percent slopes
524A—Cardwell loam, 0 to 2 percent slopes
525A—Cardwell-Riverrun complex, 0 to 2 percent slopes, saline
531C—Sappington very cobbly clay loam, 2 to 8 percent slopes
532C—Sappington-Amesha complex, 2 to 8 percent slopes
533A—Sappington clay loam, 0 to 2 percent slopes
533C—Sappington clay loam, 2 to 8 percent slopes
533D—Sappington clay loam, 8 to 15 percent slopes
534C—Sappington-Geohrock complex, 2 to 8 percent slopes
534D—Sappington-Geohrock complex, 8 to 15 percent slopes
536A—Sappington-Amesha complex, 0 to 2 percent slopes
537B—Sappington loam, 1 to 4 percent slopes, stony
537D—Sappington loam, 4 to 15 percent slopes, stony
538C—Sappington gravelly loam, 2 to 8 percent slopes
539B—Sappington-Amesha complex, 2 to 8 percent slopes, cobbly
539C—Sappington-Amesha complex, 2 to 8 percent slopes, stony
541D—Whitlash, very stony-Brickner, stony-Rock outcrop complex, 4 to 25 percent slopes
541E—Whitlash, very stony-Brickner, stony-Rock outcrop complex, 25 to 60 percent slopes
551E—Brickner, stony-Whitlash, very stony-Rock outcrop complex, 35 to 60 percent slopes
552F—Brickner, very bouldery-Rock outcrop-Tolbert, very bouldery, association, 25 to 60 percent slopes
553F—Brickner, very stony-Wickes, very bouldery-Rock outcrop complex, 15 to 60 percent slopes
554F—Brickner, very stony-Rock outcrop-Mocmont, stony, complex, 25 to 60 percent slopes
562C—Trudau-Bronec, saline, complex, 2 to 8 percent slopes
564C—Trudau-Benz clay loams, 2 to 8 percent slopes
581E—Whitecow, stony-Warneke, very stony-Rock outcrop complex, 8 to 35 percent slopes
581F—Whitecow, very stony-Warneke, very stony-Rock outcrop complex, 35 to 70 percent slopes
582E—Whitecow, bouldery-Shawmut, very bouldery-Rock outcrop complex, 15 to 45 percent slopes, warm
583E—Whitecow-Warneke complex, 8 to 35 percent slopes
584F—Whitecow-Whitecow, stony-Warneke complex, 25 to 60 percent slopes
585E—Whitecow, bouldery-Shawmut, very bouldery-Rock outcrop complex, 15 to 45 percent slopes

591F—Windham-Rock outcrop-Warneke complex, 35 to 60 percent slopes
631D—Rencot-Rock outcrop-Rencot, stony, complex, 8 to 25 percent slopes
631E—Rencot-Rencot, very stony-Rock outcrop complex, 25 to 60 percent slopes
631F—Rencot-Bronec-Rock outcrop complex, 35 to 70 percent slopes
632C—Rencot-Lahood-Rock outcrop complex, 2 to 8 percent slopes
632D—Rencot-Lahood-Rock outcrop complex, 8 to 25 percent slopes
632E—Rencot, very stony-Lahood, stony-Rock outcrop complex, 25 to 45 percent slopes
633D—Rencot, very stony-Bronec, very stony-Rock outcrop complex, 4 to 25 percent slopes
634E—Rencot, very stony-Rock outcrop-Bronec, very stony, complex, 25 to 45 percent slopes
641C—Varney gravelly loam, 2 to 8 percent slopes
642C—Varney clay loam, 2 to 8 percent slopes
642D—Varney clay loam, 8 to 15 percent slopes
643A—Varney cobbly loam, 0 to 2 percent slopes
643C—Varney cobbly loam, 2 to 8 percent slopes
644C—Varney complex, 2 to 15 percent slopes, gullied
645B—Varney-Sieben complex, 1 to 4 percent slopes, stony
645D—Varney, stony-Sieben, very stony, complex, 4 to 15 percent slopes
645E—Varney, stony-Sieben, very stony, complex, 15 to 35 percent slopes
646C—Varney loam, 2 to 8 percent slopes, stony
651C—Judell gravelly loam, 2 to 8 percent slopes
652C—Judell cobbly loam, 2 to 8 percent slopes
655C—Judell gravelly loam, 2 to 8 percent slopes, warm
662B—Judell gravelly loam, 1 to 4 percent slopes, very stony
691A—Meadowcreek, Clunton, and Cardwell soils, 0 to 2 percent slopes, channeled
692A—Meadowcreek-Nestley-Riverrun complex, 0 to 2 percent slopes
713E—Raghorn-Ethridge-Kalsted complex, 15 to 35 percent slopes
713F—Raghorn-Ethridge-Kalsted complex, 35 to 70 percent slopes
721E—Zbart-Bondoe-Brocko complex, 4 to 25 percent slopes
731C—Martinsdale, stony-Martinsdale-Hilger complex, 2 to 8 percent slopes
732D—Martinsdale-Shawmut, stony-Martinsdale, bouldery, complex, 4 to 25 percent slopes
734D—Martinsdale loam, 4 to 15 percent slopes, very stony
735C—Martinsdale-Absarook-Whitlash complex, 2 to 8 percent slopes, stony
736C—Martinsdale-Work complex, 2 to 8 percent slopes
742E—Shawmut, stony-Martinsdale, very stony, complex, 4 to 25 percent slopes
744E—Shawmut, bouldery-Shawmut, stony-Tolbert, bouldery, complex, 15 to 35 percent slopes
745D—Shawmut-Wickes-Gnojek complex, 2 to 15 percent slopes, bouldery
745E—Shawmut, bouldery-Shawmut, very bouldery-Tolbert, bouldery, complex, 15 to 45 percent slopes, dry
746E—Shawmut-Tolbert complex, 8 to 35 percent slopes
747E—Shawmut, stony-Tolbert, very stony, complex, 15 to 35 percent slopes
748E—Shawmut, stony-Wickes, very stony, complex, 15 to 45 percent slopes
751C—Sixbeacon gravelly sandy loam, 2 to 8 percent slopes
752B—Sixbeacon-Vendome complex, 1 to 4 percent slopes
753C—Sixbeacon-Cozberg complex, 2 to 8 percent slopes
754D—Sixbeacon-Cozberg, stony, complex, 4 to 15 percent slopes
755A—Vendome very cobbly loam, 0 to 4 percent slopes, very stony
773F—Rock outcrop-Pensore association, 15 to 60 percent slopes
774F—Rock outcrop-Whitlash, bouldery, association, 35 to 70 percent slopes

775F—Rock outcrop-Lap-Lap, very stony, association, 15 to 70 percent slopes
776D—Rock outcrop-Devilfence association, 2 to 25 percent slopes
777E—Rock outcrop-Clugulch-Bobowic complex, 15 to 35 percent slopes
777F—Rock outcrop-Clugulch-Bobowic complex, 35 to 70 percent slopes
778E—Rock outcrop-Kounter, very bouldery-Jeffcity, bouldery, complex, 15 to 45 percent slopes
781A—Vendome sandy loam, 0 to 8 percent slopes
782A—Vendome sandy loam, 0 to 8 percent slopes, stony
791C—Chinook sandy clay loam, 2 to 8 percent slopes, saline
811C—Ethridge, saline-Zatony clay loams, 2 to 8 percent slopes
821C—Rothiemay loam, 2 to 8 percent slopes
831E—Shoddy-Cabbart-Kobarter complex, 4 to 25 percent slopes
832E—Shoddy-Rock outcrop-Delpoint complex, 2 to 25 percent slopes
841A—Clunton loam, 0 to 2 percent slopes
851D—Walbert-Shoddy-Cabbart complex, 2 to 15 percent slopes
851F—Walbert-Shoddy-Cabbart complex, 15 to 35 percent slopes
852C—Walbert sandy clay loam, 4 to 15 percent slopes
858E—Yetull-Yetull, stony, complex, 8 to 35 percent slopes
859C—Yetull loamy fine sand, 2 to 8 percent slopes
872E—Kobarter-Abor, stony, complex, 15 to 35 percent slopes
911C—Absarook-Martinsdale, stony, complex, 2 to 8 percent slopes
915C—Quincreek channery loam, 2 to 8 percent slopes
941E—Tigeron, bouldery-Tigeron, very bouldery, complex, 15 to 45 percent slopes
942E—Tigeron extremely gravelly loam, 15 to 35 percent slopes, bouldery
943F—Tigeron, stony-Tigeron, very stony, complex, 25 to 60 percent slopes
944E—Tigeron, very bouldery-Redfern, bouldery-Rock outcrop complex, 15 to 45 percent slopes, warm
945E—Tigeron, very bouldery-Redfern, bouldery-Rock outcrop complex, 15 to 45 percent slopes, dry
946F—Tigeron, very stony-Redfern, rubbly-Rock outcrop complex, 25 to 60 percent slopes
947F—Tigeron, very stony-Redfern, rubbly-Rock outcrop complex, 25 to 60 percent slopes, dry
952F—Redfern, bouldery-Rock outcrop-Tigeron, very bouldery, complex, 25 to 60 percent slopes
953F—Redfern, rubbly-Rock outcrop-Rubble land association, 25 to 60 percent slopes
954F—Redfern, rubbly-Rock outcrop-Tigeron, very bouldery, complex, 35 to 70 percent slopes
963E—Elve-Warwood complex, 15 to 45 percent slopes, stony
964E—Elve, very stony-Elve, rubbly-Cowood, rubbly, complex, 15 to 35 percent slopes
964F—Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes, cool
965E—Elve, very stony-Cowood, rubbly, complex, 15 to 35 percent slopes
965F—Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes, dry
966E—Elve, very stony-Rock outcrop-Rubble land complex, 8 to 35 percent slopes
967F—Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes
968E—Elve, stony-Worock complex, 15 to 35 percent slopes
968F—Elve, stony-Worock complex, 35 to 60 percent slopes
969F—Elve, bouldery-Worock-Rock outcrop complex, 35 to 60 percent slopes
971F—Cowood, rubbly-Rock outcrop association, 25 to 60 percent slopes
972F—Cowood, very bouldery-Kimpton, very bouldery-Rock outcrop complex, 15 to 45 percent slopes
973D—Cowood, very stony-Elve, very stony-Rock outcrop complex, 4 to 25 percent slopes
982F—Kimpton, very bouldery-Rock outcrop-Tiban, very bouldery, complex, 25 to 50 percent slopes

991E—Libeg loam, 15 to 35 percent slopes, bouldery
992E—Libeg, very bouldery-Libeg, bouldery-Nieman, bouldery, complex, 15 to 45 percent slopes
993D—Ratiopeak-Tiban gravelly loams, 4 to 15 percent slopes, bouldery
994E—Libeg, stony-Nieman, bouldery, complex, 15 to 45 percent slopes
996D—Libeg-Monaberg gravelly loams, 2 to 15 percent slopes, bouldery
997E—Libeg, stony-Monaberg-Adel complex, 15 to 35 percent slopes
998E—Libeg-Nieman, stony, complex, 8 to 25 percent slopes
999E—Libeg, very stony-Libeg, very bouldery, complex, 4 to 25 percent slopes
999F—Libeg, very stony-Libeg, rubbly, association, 25 to 60 percent slopes
1003E—Tiban, bouldery-Cheadle, very bouldery, complex, 15 to 35 percent slopes
1004E—Tiban, rubbly-Tiban, very bouldery-Rock outcrop complex, 15 to 45 percent slopes
1101E—Monaberg, stony-Libeg, bouldery, complex, 15 to 35 percent slopes
1102B—Adel-Libeg, stony, complex, 1 to 4 percent slopes
1103D—Adel-Libeg complex, 4 to 15 percent slopes, stony
1104C—Adel loam, 2 to 8 percent slopes
1120E—Quaint channery loam, 8 to 35 percent slopes, very stony
1121E—Quaint-Rock outcrop-Redfist complex, 4 to 25 percent slopes
1121F—Quaint-Rock outcrop complex, 15 to 45 percent slopes
1122D—Quaint-Redfist channery loams, 4 to 15 percent slopes
1131C—Redfist-Quaint channery loams, 2 to 8 percent slopes
1131D—Redfist-Quaint channery loams, 8 to 15 percent slopes
1132D—Redfist, bouldery-Perma, bouldery-Rock outcrop complex, 2 to 35 percent slopes
1141D—Devilfence very channery loam, 4 to 15 percent slopes
1142E—Devilfence-Rock outcrop-Wilspring complex, 8 to 35 percent slopes
1142F—Devilfence-Rock outcrop complex, 35 to 60 percent slopes
1143F—Deville-Wilde-Rock outcrop complex, 25 to 60 percent slopes
1146E—Deville-Rock outcrop-Wilde complex, 8 to 35 percent slopes
1152D—Wilspring-Devilfence complex, 4 to 15 percent slopes
1152E—Wilspring-Devilfence-Rock outcrop complex, 15 to 35 percent slopes
1153C—Wilspring-Quincreek-Devilfence complex, 2 to 8 percent slopes
1154E—Wilde-Deville-Vigilante complex, 8 to 35 percent slopes
1154F—Wilde, stony-Vigilante-Deville, very stony, complex, 35 to 70 percent slopes
1161E—Yreka, bouldery-Hoyt, bouldery-Shaboom, very bouldery, complex, 15 to 45 percent slopes
1162E—Yreka very cobbly loam, 15 to 35 percent slopes, bouldery
1163F—Ymark, very bouldery-Elmark, very bouldery-Rock outcrop complex, 25 to 60 percent slopes
1164F—Yreka-Brickner, stony, complex, 35 to 70 percent slopes
1170E—Whitlash-Whitlash, stony-Rock outcrop complex, 15 to 35 percent slopes
1171F—Castner, bouldery-Rock outcrop complex, 25 to 50 percent slopes
1172F—Castner, very bouldery-Rock outcrop complex, 35 to 60 percent slopes
1180E—Farnuf loam, 15 to 35 percent slopes, stony
1182C—Breeton gravelly loam, 2 to 8 percent slopes
1191E—Silverchief very cobbly clay loam, 8 to 35 percent slopes, bouldery
1210C—Ferball clay loam, 2 to 8 percent slopes
1222C—Martinsdale-Martinsdale, stony-Shawmut complex, 2 to 8 percent slopes
1222E—Martinsdale-Martinsdale, stony-Shawmut complex, 15 to 35 percent slopes
1223D—Martinsdale-Shawmut complex, 2 to 15 percent slopes, bouldery

1242D—Baxton-Connieo, very bouldery-Rock outcrop complex, 4 to 15 percent slopes, moist
1242E—Baxton-Connieo, very bouldery-Rock outcrop complex, 15 to 35 percent slopes, moist
1243D—Baxton-Connieo coarse sandy loams, 4 to 15 percent slopes, bouldery
1244D—Baxton-Connieo, very bouldery-Rock outcrop complex, 4 to 15 percent slopes
1244E—Baxton-Connieo-Rock outcrop complex, 15 to 35 percent slopes
1245E—Baxton-Breeton-Connieo complex, 15 to 35 percent slopes
1246E—Baxton, stony-Breeton, bouldery-Catgulch, very stony, complex, 15 to 35 percent slopes
1247E—Baxton-Kellygulch-Connieo complex, 15 to 45 percent slopes
1250C—Work cobbly clay loam, 2 to 8 percent slopes, stony
1250E—Work very cobbly clay loam, 8 to 25 percent slopes
1271D—Placerton-Farnuf-Connieo complex, 8 to 15 percent slopes
1272D—Placerton-Connieo-Jeffcity complex, 4 to 15 percent slopes
1273E—Placerton-Farnuf-Breeton complex, 15 to 35 percent slopes
1275D—Placerton-Farnuf-Connieo gravelly sandy clay loams, 8 to 15 percent slopes
1275E—Placerton-Farnuf-Connieo complex, 15 to 35 percent slopes
1276D—Placerton-Connieo-Jeffcity complex, 4 to 15 percent slopes, warm
1277C—Placerton-Jeffcity complex, 2 to 8 percent slopes
1280D—Crackerville-Catgulch complex, 2 to 15 percent slopes, bouldery
1281D—Crackerville-Catgulch, bouldery-Rock outcrop complex, 8 to 25 percent slopes
1282D—Crackerville-Bielenberg-Catgulch, bouldery, complex, 8 to 20 percent slopes
1283E—Crackerville-Bielenberg-Catgulch, bouldery, complex, 20 to 35 percent slopes
1286E—Crackerville-Bielenberg-Catgulch, bouldery, complex, 15 to 35 percent slopes, warm
1287E—Clancy, very stony-Crampton, bouldery-Bielenberg, very stony, complex, 15 to 45 percent slopes
1321B—Beaverell, very stony-Beaverell-Sieberell, stony, complex, 1 to 4 percent slopes
1321D—Beaverell, very stony-Sieberell, stony, complex, 4 to 15 percent slopes
1322D—Beaverell, stony-Beaverell, rubbly-Sieberell, stony, complex, 2 to 15 percent slopes
1331A—Bonebasin-Wetsand complex, 0 to 2 percent slopes
1341D—Windham very gravelly loam, 2 to 15 percent slopes, very stony
1342E—Windham-Lap very cobbly loams, 15 to 45 percent slopes, bouldery
1343D—Windham-Judell very cobbly loams, 4 to 15 percent slopes, bouldery
1351D—Perma stony loam, 2 to 15 percent slopes, very bouldery
1352E—Perma-Whitlash complex, 15 to 35 percent slopes, bouldery, warm
1353F—Perma, very stony-Whitlash, very stony-Rock outcrop complex, 15 to 45 percent slopes
1355D—Wimper-Wimper, stony, complex, 4 to 15 percent slopes, warm
1355E—Wimper-Wimper, stony, complex, 15 to 35 percent slopes, warm
1356E—Wimper gravelly loam, 8 to 35 percent slopes, stony, moist
1357F—Perma, very bouldery-Shaboom, extremely bouldery-Rock outcrop complex, 35 to 60 percent slopes
1361E—Lumpgulch, bouldery-Rock outcrop-Elmark, bouldery, complex, 8 to 35 percent slopes
1362F—Lumpgulch, bouldery-Rock outcrop complex, 25 to 60 percent slopes
1372D—Burtoner-Connieo, bouldery-Rock outcrop complex, 4 to 15 percent slopes
1373E—Burtoner-Elmark-Connieo complex, 8 to 25 percent slopes, very bouldery
1374D—Burtoner-Clancy-Connieo complex, 4 to 15 percent slopes
1375D—Burtoner-Connieo, bouldery-Rock outcrop complex, 4 to 15 percent slopes, warm

1375E—Burtoner, very stony-Connieo, bouldery-Rock outcrop complex, 15 to 45 percent slopes
1376F—Burtoner, very stony-Connieo, very stony-Rock outcrop complex, 35 to 60 percent slopes
1377E—Burtoner, very stony-Crampton, bouldery-Catgulch, bouldery, complex, 15 to 45 percent slopes
1378E—Burtoner-Elmark-Shaboom, very bouldery, complex, 15 to 45 percent slopes
1381D—Jeffcity, stony-Connieo, stony-Rock outcrop complex, 2 to 15 percent slopes
1391B—Bronec fine sandy loam, 1 to 4 percent slopes
1451F—Blaincreek, very stony-Sawicki, very stony-Tolbert, very bouldery, complex, 35 to 70 percent slopes
1460C—Clasoil loam, 2 to 8 percent slopes
1461D—Bielenberg-Burtoner, very stony-Catgulch, bouldery, complex, 8 to 25 percent slopes
1540F—Shaboom, extremely bouldery-Rock outcrop-Elmark, very bouldery, association, 35 to 60 percent slopes
1541E—Shaboom, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes
1542E—Shaboom, very bouldery-Rock outcrop-Kellygulch, very bouldery, complex, 8 to 35 percent slopes
1543E—Shaboom, very bouldery-Kellygulch, very bouldery-Rock outcrop complex, 15 to 35 percent slopes
1543F—Shaboom, extremely bouldery-Kellygulch, extremely bouldery-Rock outcrop complex, 35 to 60 percent slopes
1544E—Shaboom, bouldery-Kellygulch, bouldery-Rock outcrop complex, 8 to 45 percent slopes
1563D—Hilger, rubbly-Hilger complex, 8 to 25 percent slopes
1564E—Hilger, very stony-Hilger, rubbly-Rock outcrop complex, 8 to 35 percent slopes
1591E—Catgulch, bouldery-Crackerville-Rock outcrop complex, 15 to 45 percent slopes
1595E—Connieo, bouldery-Crackerville-Rock outcrop complex, 15 to 45 percent slopes
1596C—Connieo-Rock outcrop-Placerton complex, 2 to 8 percent slopes
1602C—Farnuf-Placerton sandy clay loams, 2 to 8 percent slopes
1603C—Farnuf sandy loam, 2 to 8 percent slopes
1604D—Farnuf-Farnuf, stony-Burtoner complex, 4 to 15 percent slopes
1605C—Farnuf-Placerton sandy clay loams, 2 to 8 percent slopes, warm
1606D—Farnuf loam, 2 to 15 percent slopes
1607D—Farnuf-Placerton-Martinsdale complex, 4 to 15 percent slopes
1621D—Connieo, stony-Baxton, stony-Rock outcrop complex, 2 to 15 percent slopes
1621E—Connieo, very stony-Baxton, stony-Rock outcrop complex, 15 to 35 percent slopes
1622D—Connieo, moist-Rock outcrop complex, 2 to 15 percent slopes
1623D—Connieo-Burtoner complex, 2 to 15 percent slopes
1623E—Connieo-Baxton-Rock outcrop complex, 15 to 35 percent slopes
1624F—Connieo, very stony-Baxton, bouldery-Rock outcrop complex, 35 to 60 percent slopes
1625F—Connieo, extremely bouldery-Rock outcrop-Burtoner, extremely stony, complex, 35 to 60 percent slopes
1626D—Connieo, bouldery-Burtoner, bouldery-Rock outcrop complex, 4 to 15 percent slopes
1627E—Connieo, very bouldery-Burtoner-Rock outcrop complex, 8 to 35 percent slopes, moist
1628D—Connieo, bouldery-Ashbray, very bouldery-Rock outcrop complex, 2 to 15 percent slopes
1629C—Connieo-Catgulch-Rock outcrop complex, 2 to 8 percent slopes
1640D—Nieman, very stony-Rock outcrop-Libeg, stony, complex, 2 to 15 percent slopes
1641E—Nieman, very stony-Rock outcrop-Libeg, bouldery, complex, 15 to 45 percent slopes
1641F—Nieman, very stony-Rock outcrop-Libeg, very stony, complex, 45 to 70 percent slopes
1642F—Nieman, bouldery-Rock outcrop-Libeg, very bouldery, complex, 25 to 60 percent slopes
1643E—Nieman, stony-Libeg complex, 15 to 35 percent slopes
1643F—Nieman, stony-Libeg-Rock outcrop complex, 35 to 60 percent slopes

1651C—Sawbuck-Sawbuck, very stony-Clasoil complex, 2 to 8 percent slopes
1652E—Sawicki-Clasoil complex, 8 to 35 percent slopes, bouldery
1654E—Sawicki, stony-Blaincreek-Tolbert, very stony, complex, 15 to 45 percent slopes
1655E—Sawicki-Clasoil complex, 8 to 35 percent slopes, bouldery, warm
1656E—Sawicki-Bielenberg, very stony-Tolbert, very stony, complex, 15 to 45 percent slopes
1657E—Sawicki, very bouldery-Crampton, bouldery-Catgulch, bouldery, complex, 15 to 45 percent slopes
1658D—Sawicki, stony-Blaincreek, very stony, complex, 4 to 15 percent slopes
1658E—Sawicki, very stony-Blaincreek, very stony-Tolbert, bouldery, complex, 15 to 45 percent slopes
1659E—Sawbuck, stony-Sawbuck, bouldery, complex, 15 to 35 percent slopes
1661D—Catgulch-Baxton complex, 2 to 15 percent slopes, stony
1661E—Catgulch-Baxton complex, 15 to 35 percent slopes, stony
1662D—Catgulch, very stony-Rock outcrop-Burtoner complex, 4 to 15 percent slopes
1663D—Catgulch, bouldery-Burtoner, bouldery-Rock outcrop complex, 2 to 15 percent slopes
1664E—Catgulch, bouldery-Rock outcrop-Ashbray, bouldery, complex, 4 to 35 percent slopes
1665F—Catgulch, very bouldery-Rock outcrop-Connieo, very stony, complex, 35 to 60 percent slopes
1667E—Catgulch, extremely bouldery-Baxton, extremely bouldery-Burtoner, bouldery, complex, 15 to 35 percent slopes
1671E—Tolbert-Blaincreek complex, 8 to 35 percent slopes, warm
1672E—Tolbert-Blaincreek complex, 8 to 35 percent slopes
1675E—Tolbert, very stony-Blaincreek, stony-Rock outcrop complex, 8 to 35 percent slopes
1675F—Tolbert, very stony-Rock outcrop-Blaincreek, very stony, complex, 35 to 60 percent slopes
1680D—Raynesford silt loam, 4 to 15 percent slopes
1690F—Cheadle, very stony-Rock outcrop-Tiban, bouldery, complex, 15 to 45 percent slopes
1721C—Martinsdale loam, 2 to 8 percent slopes, warm
1722C—Martinsdale-Martinsdale, stony-Shawmut complex, 2 to 8 percent slopes, warm
1722E—Martinsdale-Martinsdale, stony-Shawmut complex, 15 to 35 percent slopes, warm
1723D—Martinsdale-Shawmut complex, 2 to 15 percent slopes, bouldery, warm
1724D—Martinsdale-Shawmut, stony-Martinsdale, bouldery, complex, 4 to 25 percent slopes, warm
1731E—Tepecreek, bouldery-Caseypeak, very bouldery-Rock outcrop complex, 8 to 35 percent slopes
1731F—Tepecreek, very bouldery-Caseypeak, rubbly-Rock outcrop complex, 35 to 60 percent slopes
1732F—Tepecreek, very bouldery-Caseypeak, very bouldery-Rock outcrop complex, 35 to 60 percent slopes
1734F—Hiore, stony-Kurrie, stony-Caseypeak, very stony, complex, 35 to 60 percent slopes
1735E—Tepecreek, stony-Caseypeak, very bouldery-Rock outcrop complex, 15 to 35 percent slopes
1735F—Tepecreek, stony-Caseypeak, very stony-Rock outcrop complex, 35 to 60 percent slopes
1740E—Tropal, bouldery-Hanson, stony-Rock outcrop complex, 8 to 25 percent slopes
1741F—Tropal, bouldery-Rock outcrop-Whitore, bouldery, complex, 15 to 45 percent slopes
1742F—Tropal, very bouldery-Rock outcrop complex, 25 to 60 percent slopes
1750F—Whitore, bouldery-Tropal, very bouldery-Rock outcrop complex, 25 to 45 percent slopes
1751F—Whitore, very stony-Tropal, very bouldery-Rock outcrop complex, 15 to 45 percent slopes
1752E—Whitore, stony-Helmville, bouldery-Firada, very stony, complex, 15 to 45 percent slopes
1753E—Whitore, stony-Tropal, very stony-Firada, very stony, complex, 8 to 35 percent slopes
1760E—Hanson, stony-Whitore, bouldery, complex, 8 to 35 percent slopes
1770E—Helmville, rubbly-Tiban, very bouldery-Rock outcrop complex, 15 to 45 percent slopes

1781E—Firada, stony-Tropal, very stony-Rock outcrop complex, 4 to 25 percent slopes
1790F—Sigbird, very bouldery-Sigbird, stony-Rock outcrop complex, 25 to 70 percent slopes
1800D—Breeton coarse sandy loam, 4 to 15 percent slopes
1802D—Breeton-Baxton-Connieo complex, 4 to 15 percent slopes
1803C—Breeton-Cometcrik complex, 2 to 8 percent slopes
1810F—Hoyt, very stony-Ymark, bouldery-Shaboom, very bouldery, complex, 25 to 60 percent slopes
1821F—Kellygulch, bouldery-Rock outcrop-Bielenberg complex, 35 to 70 percent slopes
1822F—Kellygulch, stony-Shaboom, very bouldery-Rock outcrop association, 45 to 75 percent slopes
1823E—Kellygulch, stony-Shaboom, very bouldery-Rock outcrop complex, 15 to 35 percent slopes
1823F—Kellygulch, stony-Shaboom, very bouldery-Rock outcrop complex, 35 to 60 percent slopes
1830E—Clancy-Bielenberg-Breeton complex, 15 to 35 percent slopes
1831D—Clancy-Burtoner, bouldery, complex, 4 to 15 percent slopes
1832D—Clancy-Burtoner, bouldery-Rock outcrop complex, 4 to 15 percent slopes
1833D—Clancy-Connieo complex, 2 to 15 percent slopes
1835D—Clancy-Bielenberg-Connieo complex, 4 to 15 percent slopes
1836E—Clancy, bouldery-Bielenberg, stony-Catgulch, bouldery, complex, 15 to 45 percent slopes
1837E—Clancy-Bielenberg-Connieo complex, 15 to 35 percent slopes
1838D—Clancy-Clancy, very stony-Bielenberg complex, 4 to 15 percent slopes
1841D—Tuggle-Branham-Rock outcrop complex, 2 to 15 percent slopes
1842D—Caseypeak-Branham-Rock outcrop complex, 2 to 15 percent slopes
1842E—Caseypeak-Branham-Rock outcrop complex, 15 to 35 percent slopes
1842F—Caseypeak, bouldery-Branham, bouldery-Rock outcrop complex, 35 to 60 percent slopes
1851D—Branham-Lowder loams, 0 to 8 percent slopes
1851E—Branham-Lowder loams, 8 to 25 percent slopes
1853D—Branham-Tuggle complex, 2 to 15 percent slopes
1853E—Branham-Tuggle complex, 15 to 35 percent slopes
1861F—Clugulch-Bobowic-Rock outcrop complex, 35 to 70 percent slopes
1871E—Hiore, stony-Rock outcrop complex, 15 to 35 percent slopes
1871F—Hiore, stony-Rock outcrop complex, 35 to 70 percent slopes
1872E—Hiore-Clugulch-Rock outcrop complex, 15 to 35 percent slopes
1872F—Hiore-Clugulch-Rock outcrop complex, 35 to 70 percent slopes
1901F—Warwood-Tigeron, very stony-Cowood, very stony, complex, 25 to 60 percent slopes
1902D—Warwood, very bouldery-Warwood, very stony-Tigeron, very bouldery, complex, 2 to 15 percent slopes
1910F—Elmark, very bouldery-Rock outcrop-Shaboom, extremely bouldery, complex, 25 to 60 percent slopes
1921D—Judell-Lap, very stony, complex, 4 to 15 percent slopes
1921E—Judell-Lap, very stony, complex, 15 to 35 percent slopes
1930E—Elmark-Kellygulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes
1933E—Elmark, bouldery-Breeton-Shaboom, bouldery, complex, 15 to 45 percent slopes
1940E—Elmark, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes
1945E—Elmark, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes, dry
1946E—Elmark, bouldery-Hoyt-Shaboom, very bouldery, complex, 8 to 35 percent slopes, dry
1947E—Elmark, bouldery-Burtoner-Rock outcrop complex, 8 to 45 percent slopes
1948E—Elmark, very bouldery-Skyview, very bouldery-Rock outcrop complex, 15 to 45 percent slopes

1950F—Franconi, very bouldery-Warwood-aseypeak, very bouldery, complex, 25 to 60 percent slopes
1960D—Lumpgulch, bouldery-Hoyt-Shaboom, very bouldery, complex, 4 to 15 percent slopes
1961E—Lumpgulch, bouldery-Hoyt-Shaboom, very bouldery, complex, 15 to 45 percent slopes
1962E—Lumpgulch, bouldery-Yreka, very bouldery-Shaboom, very bouldery, complex, 15 to 35 percent slopes
1963F—Lumpgulch, very bouldery-Rock outcrop-Kellygulch, very bouldery, complex, 25 to 60 percent slopes
1964E—Lumpgulch, very bouldery-Shaboom, very bouldery-Rock outcrop complex, 8 to 25 percent slopes
1965E—Lumpgulch, bouldery-Ymark, very bouldery-Rock outcrop complex, 15 to 45 percent slopes
1970E—Bignell, stony-Yreka, very stony, complex, 15 to 35 percent slopes
1980F—Stemple cobbly loam, 35 to 60 percent slopes, very stony
1990F—Bobowic, very bouldery-Rock outcrop-Tepecreek, very bouldery, complex, 25 to 60 percent slopes
1991D—Bobowic-Clugulch, bouldery-Rock outcrop complex, 4 to 25 percent slopes
2000E—Skyview, very bouldery-Rock outcrop-Roegulch, very bouldery, complex, 8 to 35 percent slopes
2001E—Skyview, very bouldery-Elmark, very bouldery-Rock outcrop complex, 15 to 45 percent slopes
2011D—Shawmut gravelly loam, 4 to 15 percent slopes, bouldery, warm
2012D—Shawmut, stony-Martinsdale, very stony, complex, 4 to 15 percent slopes, warm
2012E—Shawmut, stony-Martinsdale, very stony, complex, 15 to 25 percent slopes, warm
2013E—Shawmut, bouldery-Wickes, stony-Tolbert, bouldery, complex, 15 to 35 percent slopes
2014E—Shawmut-Tolbert complex, 8 to 35 percent slopes, warm
2020D—Shawmut, stony-Shawmut, bouldery, complex, 4 to 15 percent slopes
2030E—Kokoruda-Elmark, very bouldery-Rock outcrop complex, 8 to 35 percent slopes
2031D—Eagleton, stony-Kokoruda-Cometcrik complex, 2 to 25 percent slopes
2040F—Shaboom, extremely bouldery-Rock outcrop-Rubble land association, 35 to 70 percent slopes
2041F—Rock outcrop-Catgulch, bouldery, complex, 15 to 70 percent slopes
2042F—Rock outcrop-Cheadle, very bouldery-Tiban, very bouldery, complex, 15 to 50 percent slopes
2043F—Rencot, very stony-Rencot, bouldery-Rock outcrop association, 15 to 60 percent slopes
2045F—Caseypeak, very stony-Rock outcrop-Rubble land association, 15 to 60 percent slopes, dry
2046F—Caseypeak, very bouldery-Rock outcrop-Rubble land association, 15 to 60 percent slopes, cool
2051E—Opitz, bouldery-Branham, very bouldery-Tuggle, very bouldery, complex, 8 to 35 percent slopes
2081F—Windham, very stony-Rock outcrop-Lap, very stony, complex, 35 to 70 percent slopes, warm
2082D—Windham-Judell complex, 8 to 15 percent slopes, warm
2084E—Windham, stony-Maiden, very stony-Lap, very stony, complex, 15 to 35 percent slopes, warm
2086E—Windham-Windham, stony, complex, 15 to 35 percent slopes, warm
2088D—Windham-Judell gravelly loams, 8 to 25 percent slopes, stony, warm
2090F—Caseypeak, very bouldery-Franconi, very bouldery-Rock outcrop complex, 25 to 60 percent slopes
2091E—Caseypeak, bouldery-Franconi, bouldery-Rock outcrop complex, 8 to 35 percent slopes
2110D—Sebud very cobbly loam, 4 to 15 percent slopes, very stony
2111E—Sebud, very stony-Hapgood complex, 8 to 45 percent slopes
2112D—Sebud-Marcel complex, 4 to 25 percent slopes, bouldery
2121F—Hapgood-Hanson-Tiban complex, 25 to 60 percent slopes, very stony

2122F—Hapgood-Tiban complex, 35 to 70 percent slopes, very stony
2123F—Hapgood-Sebud-Arrowpeak complex, 35 to 60 percent slopes, very stony
2125F—Cowood, rubbly-Elve, very stony-Rock outcrop complex, 25 to 60 percent slopes
2151E—Releep, very bouldery-Kurrie, very bouldery-Rock outcrop complex, 15 to 35 percent slopes
2161E—Ellena, bouldery-Worock, very bouldery-Rock outcrop complex, 15 to 45 percent slopes
2161F—Kurrie, very bouldery-Ellena, very bouldery-Rock outcrop complex, 25 to 60 percent slopes
2171F—Hiore-Kurrie, stony, complex, 25 to 60 percent slopes
2172F—Rubick, very stony-Rock outcrop complex, 35 to 60 percent slopes
2173F—Rubick gravelly sandy loam, 35 to 60 percent slopes, stony
2181F—Repkie, very stony-Yreka, stony-Skyview, very bouldery, complex, 25 to 60 percent slopes
2211E—Sebud-Arrowpeak, stony, complex, 8 to 45 percent slopes
2211F—Sebud, very stony-Arrowpeak, very stony-Rock outcrop complex, 35 to 60 percent slopes
2212D—Sebud, very stony-Libeg-Arrowpeak, stony, complex, 4 to 15 percent slopes
2212E—Sebud, very stony-Libeg, stony-Arrowpeak, stony, complex, 15 to 35 percent slopes
2213E—Sebud, stony-Surdal, stony-Arrowpeak, very stony, complex, 8 to 35 percent slopes
2213F—Sebud, stony-Surdal, stony-Arrowpeak, very stony, complex, 35 to 60 percent slopes
2214E—Sebud, bouldery-Surdal, very bouldery-Arrowpeak, very bouldery, complex, 15 to 35 percent slopes
2215D—Sebud-Tibkey cobbly loams, 2 to 15 percent slopes, bouldery
2216D—Sebud-Surdal complex, 4 to 25 percent slopes, stony
2221E—Arrowpeak, very stony-Surdal, stony-Rock outcrop complex, 8 to 35 percent slopes
2222F—Arrowpeak, very stony-Sebud, stony-Surdal, very stony, complex, 25 to 60 percent slopes
2230B—Tineman cobbly loam, 2 to 8 percent slopes, very stony
2251F—Nivean, very stony-Rock outcrop-Rubble land complex, 25 to 60 percent slopes
2252E—Nivean, very stony-Macabre, stony-Rock outcrop complex, 15 to 35 percent slopes
2261D—Lowland loam, 4 to 15 percent slopes, stony
2261E—Lowland loam, 15 to 35 percent slopes, stony
2261F—Lowland, stony-Rock outcrop-Rubble land complex, 35 to 60 percent slopes
2270F—Macabre, very stony-Rock outcrop-Rubble land complex, 35 to 60 percent slopes
2271D—Macabre gravelly loam, 8 to 15 percent slopes
2281F—Judco, stony-Torpy, stony-Rock outcrop complex, 35 to 60 percent slopes
2291F—Mocmont-Kadygulch cobbly loams, 35 to 60 percent slopes, very stony
2301F—Mocmont, bouldery-Roegulch, rubbly-Rock outcrop complex, 25 to 60 percent slopes
2311F—Worock, stony-Cowood, very stony-Rock outcrop complex, 35 to 60 percent slopes
2312F—Worock, stony-Elve, stony-Rock outcrop complex, 35 to 60 percent slopes
2321D—Torpy loam, 4 to 15 percent slopes
2321E—Torpy gravelly loam, 15 to 35 percent slopes
2321F—Torpy gravelly loam, 35 to 60 percent slopes
2322E—Lowland-Torpy complex, 15 to 35 percent slopes
2322F—Lowland-Torpy complex, 35 to 60 percent slopes
2331B—Mooseflat loam, 1 to 4 percent slopes
2332B—Mooseflat-Elvick loams, 1 to 4 percent slopes
2350D—Clasoil, very stony-Sawicki, bouldery, complex, 4 to 15 percent slopes
2360E—Gnojek, stony-Wickes, stony-Shawmut complex, 8 to 35 percent slopes
2360F—Gnojek, stony-Wickes, stony-Rock outcrop complex, 35 to 70 percent slopes
2361E—Gnojek, stony-Wickes, stony-Rock outcrop complex, 8 to 35 percent slopes
2361F—Gnojek, stony-Rock outcrop-Wickes, stony, complex, 25 to 60 percent slopes
2391C—Marcel, very bouldery-Tibkey, bouldery, complex, 2 to 8 percent slopes
2411E—Ashbray, bouldery-Rock outcrop-Rubble land complex, 8 to 45 percent slopes

2412F—Ashbray, rubbly-Rock outcrop-Kellygulch, very stony, complex, 35 to 70 percent slopes
2421E—Surdal, stony-Arrowpeak, very stony, complex, 4 to 25 percent slopes
2431C—Foolhen, stony-Tibkey, bouldery, complex, 0 to 8 percent slopes
2441E—Tineman, very stony-Franconi, bouldery-Rock outcrop complex, 4 to 25 percent slopes
2450E—Kounter, bouldery-Rock outcrop-Cedric, bouldery, complex, 8 to 35 percent slopes
2451D—Kounter, bouldery-Rock outcrop-Cedric, bouldery, complex, 4 to 25 percent slopes, dry
2452E—Kounter, very bouldery-Rock outcrop-Jeffcity, bouldery, complex, 15 to 35 percent slopes
2460D—Cedric, bouldery-Jeffcity, bouldery-Rock outcrop complex, 2 to 15 percent slopes
2461D—Cedric, bouldery-Rock outcrop-Jeffcity, bouldery, complex, 2 to 15 percent slopes
2471F—Elve, stony-Worock, stony-Rock outcrop complex, 35 to 60 percent slopes
2472E—Elvick-Lowder complex, 8 to 25 percent slopes, very bouldery
2473E—Elve-Cowood very cobbly loams, 8 to 35 percent slopes, very stony
2481F—Brickner, very bouldery-Rock outcrop-Rubble land complex, 15 to 60 percent slopes
2483F—Elve, rubbly-Rock outcrop-Rubble land association, 25 to 60 percent slopes, cool
2484F—Rock outcrop-Rubble land-Redfern, rubbly, association, 35 to 70 percent slopes
2485F—Redfern, rubbly-Rock outcrop-Tigeron, very bouldery, association, 25 to 70 percent slopes
2486F—Elve, rubbly-Rock outcrop-Rubble land complex, 35 to 60 percent slopes
2487F—Torpy, rubbly-Rock outcrop-Rubble land complex, 35 to 60 percent slopes
2488D—Elve, very stony-Rock outcrop-Rubble land complex, 4 to 35 percent slopes
2501D—Lowder-Elvick very cobbly loams, 2 to 15 percent slopes, very bouldery
2511C—Monaberg loam, 2 to 8 percent slopes, bouldery
2581E—Worock, very bouldery-Elve, very stony, complex, 15 to 35 percent slopes
2582D—Worock-Elve very cobbly loams, 2 to 15 percent slopes, very bouldery, cool
2582E—Worock, very bouldery-Worock, rubbly, complex, 8 to 35 percent slopes
2582F—Worock, rubbly-Rock outcrop-Rubble land complex, 35 to 60 percent slopes
2583D—Worock, stony-Worock, very bouldery, complex, 2 to 15 percent slopes
2583F—Worock, very bouldery-Worock, rubbly, complex, 35 to 60 percent slopes
2584E—Worock, very bouldery-Worock, rubbly, complex, 15 to 45 percent slopes, dry
2591F—Kadygulch-Roegulch, stony, complex, 35 to 60 percent slopes
2661F—Elve-Cowood complex, 45 to 70 percent slopes
2662E—Elve-Cowood complex, 15 to 45 percent slopes
2681E—Sawbuck-Catgulch, stony, complex, 8 to 45 percent slopes
2682E—Sawbuck, stony-Yreka, stony-Catgulch, very stony, complex, 15 to 45 percent slopes
2691F—Connieo, very stony-Crackerville, stony-Rock outcrop complex, 35 to 60 percent slopes
2695E—Macabre-Nivean complex, 15 to 35 percent slopes
2695F—Macabre-Judco-Rock outcrop complex, 35 to 60 percent slopes
2701F—Crampton-Catgulch complex, 35 to 60 percent slopes, very stony
2705F—Vitroff-Torpy loams, 35 to 60 percent slopes
2711E—Libeg very gravelly loam, 15 to 45 percent slopes
2712D—Libeg-Mooseflat loams, 4 to 25 percent slopes
3001B—Aridic Ustifluvents, 0 to 4 percent slopes
3033B—Sappington-Amesha loams, 1 to 4 percent slopes
3033C—Sappington-Amesha loams, 4 to 8 percent slopes
3061E—Holter-Castner channery loams, 8 to 45 percent slopes
3064D—Windham channery loam, 4 to 15 percent slopes

3137B—Musselshell-Crago complex, 2 to 8 percent slopes
3141E—Crago-Pensore channery loams, 15 to 45 percent slopes
3218A—Meadowcreek-Fairway complex, 0 to 2 percent slopes
3233C—Geohrock-Crago very cobbly loams, 2 to 8 percent slopes
3433E—Crago-Musselshell gravelly loams, 4 to 35 percent slopes
3486F—Peeler-Rock outcrop complex, 15 to 60 percent slopes
3501B—Fluvaquents-Fluvaquentic Haplustolls complex, 0 to 4 percent slopes
3513A—Attewan-Nippt complex, 0 to 2 percent slopes
3532B—Geohrock gravelly loam, 2 to 8 percent slopes
3664E—Windham-Whitecow-Lap channery loams, 15 to 45 percent slopes
3685F—Whitecow channery loam, 25 to 60 percent slopes
3885F—Whitecow-Warneke channery loams, 15 to 45 percent slopes
DAM—Dam
M-W—Miscellaneous water
W—Water

Soil Survey of
Jefferson County Area and Part of Silver Bow County, Montana

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

This part of the soil survey includes interpretations for various uses of the soils and data on soil properties. This information can be used to plan the use and management of soils for crops and pasture; as rangeland; as forest land; and as sites for buildings, sanitary facilities, and highways and other transportation systems. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Interpretive ratings help engineers, planners, and others understand how soil properties influence important nonagricultural uses, such as building site development and construction materials. The ratings indicate the most restrictive soil features affecting the suitability of the soils for these uses.

Soils are rated in their natural state. No unusual modification of the soil site or material is made other than that which is considered normal practice for the rated use. Even though soils may have limitations, it is important to remember that engineers and others can modify soil features or can design or adjust the plans for a structure to compensate for most of the limitations. Most of these practices, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs of site preparation and maintenance.

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, somewhat limited,* and *very limited.* The suitability ratings are expressed as *well suited, moderately suited, poorly suited,* and *unsuited* or as *good, fair,* and *poor.*

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

The tables “Classification of the Soils” and “Acreage and Proportionate Extent of the Soils” are at the end of this section.

Agronomy

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the Natural Resources Conservation Service is explained, and important farmland is described.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units" in Part I of this survey. Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

According to 1989 Montana agricultural statistics, the survey area includes about 77,100 acres of cropland. Of this total, about 15,000 acres is nonirrigated and 62,100 acres is under irrigation. The main crops include wheat, barley, and oats. Alfalfa and other grasses and legumes are used for hay and pasture.

The major areas in which dryland crops are produced are near Three Forks and Milligan Canyon and along the northern boundary of Jefferson County just south of East Helena. Most dryland crops are produced using a crop-fallow rotation. If moisture is available at planting time, fields may be recropped instead of fallowed.

Yields of nonirrigated crops near East Helena are generally higher and more consistent from year to year than in the southeastern part of Jefferson County. Major management concerns affecting dryland farming are the hazard of winter injury, a lack of snow cover, dry soil conditions, soil blowing, and calcareous soils.

Dryland farming yields generally can be maintained or improved by reducing the hazard of erosion, increasing the content of organic matter in the soil, controlling weeds and insects, applying fertilizer, and avoiding excess tillage.

Dryland pastures consist mainly of crested wheatgrass for spring grazing.

The major irrigated areas are along Pipestone and Whitetail Creeks and along the North Boulder and Jefferson Rivers. The main crops grown under sprinkler and flooding irrigation are legumes, mixed grasses and legumes, and grasses grown for hay and pasture in rotation with small grain crops. Some annual legume specialty crops also are grown.

The main management concerns affecting irrigated cropland are proper management of irrigation water, weed control, and applications of fertilizer. Proper management of irrigation water, which includes timely applications and adequate amounts of water, helps to prevent overirrigation and the loss of nutrients and increases the life of the stands. Proper irrigation also helps to maintain higher production levels.

Pasture and hayland areas could be improved by reestablishing the desired grasses and legumes. Growing small grain crops for several years and then planting and maintaining a permanent cover for a period of 5 to 12 years can improve these areas.

Cropland Limitations and Hazards

The management concerns affecting the use of the detailed soil map units in the survey area for crops are shown in the table "Cropland Limitations and Hazards." The main concerns in managing nonirrigated cropland are conserving moisture, controlling soil blowing and water erosion, and maintaining soil fertility.

Conserving moisture consists primarily of reducing the evaporation and runoff rates and increasing the rate of water infiltration. Applying conservation tillage and conservation cropping systems, farming on the contour, stripcropping, establishing field windbreaks, and leaving crop residue on the surface conserve moisture.

Generally, a combination of several practices is needed to control *soil blowing* and *water erosion.* Conservation tillage, stripcropping, field windbreaks, contour farming, conservation cropping systems, crop residue management, terraces, diversions, and grassed waterways help to prevent excessive soil loss.

Measures that are effective in maintaining *soil fertility* include applying fertilizer, both organic and inorganic, including manure; incorporating crop residue or green manure crops into the soil; and using proper crop rotations. Controlling erosion helps to

prevent the loss of organic matter and plant nutrients and thus helps to maintain productivity, although the level of fertility can be reduced even in areas where erosion is controlled. All soils used for nonirrigated crops respond well to applications of fertilizer.

Some of the considerations shown in the table cannot be easily overcome. These are *channels, flooding, depth to rock, ponding, gullies,* and *lack of timely precipitation.* Additional considerations are as follows:

Areas of rock outcrop and *areas of rubble land.*—Farming around these areas may be feasible. Subsoiling or deep ripping soft sedimentary beds increases the effective rooting depth and the rate of water infiltration.

Excessive permeability.—This limitation causes deep leaching of nutrients and pesticides. The capacity of the soil to retain moisture for plant use is poor.

Lime content, limited available water capacity, poor tilth, and *restricted permeability.*—These limitations can be minimized by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems. Also, crops may respond well to additions of phosphate fertilizer to soils that have a high content of lime.

Potential for ground-water contamination.—The proper use of nutrients and pesticides can reduce the risk of ground-water contamination.

Potential for surface-water contamination.—The risk of surface-water contamination can be reduced by the proper use of nutrients and pesticides and by conservation farming practices that reduce the runoff rate.

Rock fragments in the surface layer.—This limitation causes rapid wear of tillage equipment. It cannot be easily overcome.

Root-restrictive layer.—A cemented pan limits root development and may restrict the types of crops that can be grown.

Salt or sodium content.—In areas where this is a limitation, only salt- and sodium-tolerant crops should be grown.

Short frost-free period.—If the growing season is less than 90 days, short-season crops or grasses should be grown.

Slope.—Where the slope is more than 8 percent, water erosion and soil blowing may be accelerated unless conservation farming practices are applied.

Stones or boulders on the surface.—Stones or boulders on or near the surface can hinder normal tillage unless they are removed.

On irrigated soils the main management concerns are *efficient water use, nutrient management, control of erosion, pest and weed control,* and *timely planting and harvesting* for a successful crop. An irrigation system that provides optimum control and distribution of water at minimum cost is needed. Overirrigation wastes water, leaches plant nutrients, and causes erosion. Also, it can create drainage problems, raise the water table, and increase soil salinity.

Explanation of Criteria

Areas of rock outcrop.—Rock outcrop is a named component of the map unit.

Areas of rubble land.—Rubble land is a named component of the map unit.

Channeled.—The word “channeled” is included in the map unit name.

Dense layer.—The bulk density is 1.80 g/cc or greater within the soil profile.

Depth to rock.—The depth to bedrock is less than 40 inches.

Excessive permeability.—The upper limit of the permeability range is 6 inches per hour or more within the soil profile.

Flooding.—The component of the map unit is occasionally flooded or frequently flooded.

Gullied.—The word “gullied” is included in the map unit name.

Lack of timely precipitation.—The component of the map unit has a Xeric moisture regime. The amount of annual precipitation is no more than 14 inches.

Lime content.—The component is assigned to wind erodibility group 4L or has more than 5 percent lime in the upper 10 inches.

Limited available water capacity.—The available water capacity calculated to a depth of 60 inches or to a root-limiting layer is 5 inches or less.

Ponding.—Ponding duration is assigned to the map unit component. The water table is above the surface.

Poor tilth.—The component of the map unit has more than 35 percent clay in the surface layer.

Potential for ground-water contamination.—The soil has a water table within a depth of 4 feet or hard bedrock within the profile, or permeability is more than 6 inches per hour within the soil.

Restricted permeability.—Permeability is 0.06 inch per hour or less within the soil profile.

Rock fragments in the surface layer.—The terms describing the texture of the surface layer include any rock fragment modifier, except for gravelly or channery, and “stones or boulders on the surface” are not already indicated as a limitation.

Root-restrictive layer.—A cemented pan is within 40 inches of the surface.

Salt content.—The electrical conductivity is 4 or

more in the surface layer or 8 or more within a depth of 30 inches.

Short frost-free period.—The map unit has a growing season of less than 90 frost-free days.

Slope.—The upper slope range of the component of the map unit is more than 8 percent.

Sodium content.—The sodium adsorption ratio of the component of the map unit is more than 13 within a depth of 30 inches.

Soil blowing.—The wind erodibility index multiplied by the selected high C factor for the survey area and then divided by the T factor is more than 8 for the component of the map unit.

Stones or boulders on the surface.—The terms describing the texture of the surface layer include any stony or bouldery modifier, or the soil is a stony or bouldery phase.

Surface crusting.—The sodium adsorption ratio in the surface layer is 5 or more for any texture and 4 or more if the texture is silt, silt loam, loam, or very fine sandy loam.

Water erosion.—The K factor of the surface layer multiplied by the upper slope limit is more than 2.

Water table.—The component of the map unit has a water table within a depth of 60 inches.

Crop Yield Estimates

The average yields per acre that can be expected of the principal crops under a high level of management are shown in the table "Land Capability and Yields per Acre of Crops and Pasture." In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

The nonirrigated small grain yields represent a maximum potential estimated using a crop yield model based on Montana Agricultural Experiment Station Special Report 35. Basic assumptions in this model include soil moisture at field capacity to a depth of 40 inches, a 70 percent annual precipitation probability as published by the National Climatic Data Center, fertilization, and full control of pests and weeds. Yields of irrigated small grain crops are not provided in the table. The model has been validated with collected yield data.

Forage crop yields are estimates based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

For yields of irrigated crops, it is assumed that the irrigation system is adapted to the soils and to the forage crops grown, that good-quality irrigation water is uniformly applied as needed, and that tillage is kept to a minimum.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in the table are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Pasture and Hayland Interpretations

Under good management, proper grazing is essential for the production of high-quality forage, stand survival, and erosion control. Proper grazing helps plants to maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotation grazing and renovation also are important management practices.

Yield estimates are often indicated in animal unit months (AUM)—the amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about forage yields other than those shown in the table "Land Capability and Yields per Acre of Crops and Pasture."

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded.

The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forest land, or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forest land, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forest land, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forest land, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 3e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forest land, wildlife habitat, or recreation.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6. These units are not given in all soil surveys.

The capability classification of map units in this survey area is given in the yields table.

Important Farmland

This section provides definitions of prime farmland and other kinds of important farmland. The soils in the survey area that are considered important farmland are listed in the table “Important Farmland” at the end of this section. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in the table “Acreage and Proportionate Extent of the Soils.” The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading “Detailed Soil Map Units” in Part I of this survey.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation’s short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation’s prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is

available for these uses. It could be cultivated land, pastureland, forest land, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

Unique Farmland

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops. It has the special combination of soil qualities, location, growing season, and moisture supply needed for the economic production of sustained high yields of a specific high-quality crop when treated and managed by acceptable farming methods. Examples of such crops are citrus, tree nuts, olives, cranberries, and vegetables.

Unique farmland is used for a specific high-value food or fiber crop; has an adequate supply of available moisture for the specific crop because of stored moisture, precipitation, or irrigation; and has a combination of soil qualities, growing season, temperature, humidity, air drainage, elevation, aspect, and other factors, such as nearness to markets, that favors the production of a specific food or fiber crop.

Lists of unique farmland are developed as needed in cooperation with conservation districts and others.

Additional Farmland of Statewide Importance

Some areas other than areas of prime and unique farmland are of statewide importance in the production of food, feed, fiber, forage, and oilseed crops. The criteria used in defining and delineating these areas are determined by the appropriate state agency or agencies. Generally, additional farmland of statewide importance includes areas that nearly meet the criteria for prime farmland and that economically produce high yields of crops when treated and managed by acceptable farming methods. Some areas can produce as high a yield as areas of prime farmland if conditions are favorable. In some states, additional farmland of statewide importance may include tracts of land that have been designed for agriculture by state law.

Farmland of statewide importance in the survey area is included in the table “Important Farmland.” Criteria are provided in the Field Office Technical Guide, which is available in the local office of the Natural Resources Conservation Service.

Additional Farmland of Local Importance

This land consists of areas that are of local importance in the production of food, feed, fiber, forage, and oilseed crops and are not identified as having national or statewide importance. Where appropriate, this land is identified by local agencies. It may include tracts of land that have been designated for agriculture by local ordinance.

Lists of farmland of local importance are developed as needed in cooperation with conservation districts and others.

Erosion Factors

Soil erodibility (K) and soil-loss tolerance (T) factors are used in an equation that predicts the amount of soil lost through water erosion in areas of cropland. The procedure for predicting soil loss is useful in guiding the selection of soil and water conservation practices. The erosion factors for the soils in the survey area are listed in the table “Physical Properties of the Soils” under the heading “Soil Properties.”

Soil Erodibility (K) Factor

The soil erodibility (K) factor indicates the susceptibility of a soil to sheet and rill erosion by water. The soil properties that influence erodibility are those that affect the infiltration rate, the movement of water through the soil, and the water storage capacity of the soil and those that allow the soil to resist dispersion, splashing, abrasion, and the transporting forces of rainfall and runoff. The most important soil properties are the content of silt plus very fine sand, the content of sand coarser than very fine sand, the content of organic matter, soil structure, and permeability.

Fragment-Free Soil Erodibility (Kf) Factor

This is one of the factors used in the revised Universal Soil Loss Equation. It shows the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Soil-Loss Tolerance (T) Factor

The soil-loss tolerance (T) factor is an estimate of the maximum annual rate of soil erosion that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons of soil loss per acre per year. Ratings of 1 to 5 are used, depending on soil properties and prior erosion. The criteria used in assigning a T factor to a soil include maintenance of an adequate rooting depth for crop production, potential reduction of crop yields, maintenance of water-control structures affected by sedimentation, prevention of gullying, and the value of nutrients lost through erosion.

Wind Erodibility Groups

Wind erodibility is directly related to the percentage of dry, nonerodible surface soil aggregates larger than 0.84 millimeter in diameter. From this percentage, the wind erodibility index (I) factor is determined. This factor is an expression of the stability of the soil aggregates, or the extent to which they are broken down by tillage and the abrasion caused by windblown soil particles. Soils are assigned to wind erodibility groups (WEG) having similar percentages of dry soil aggregates larger than 0.84 millimeter. The wind erodibility groups and wind erodibility index numbers are listed in the table “Physical Properties of the Soils.”

Additional information about wind erodibility groups and K, Kf, T, and I factors can be obtained from local offices of the Natural Resources Conservation Service or the Cooperative Extension Service.

Rangeland

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland or forest understory vegetation are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

The table "Rangeland and Grazeable Understory Productivity and Characteristic Plant Communities" shows, for each soil that supports vegetation suitable for grazing, the ecological site; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of each species. An explanation of the column headings in the table follows.

An *ecological site* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of the site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Total dry-weight production is the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a *favorable* year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a *normal* year, growing conditions are about average. In an *unfavorable* year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Characteristic native vegetation—the grasses, forbs, and shrubs that make up most of the potential natural plant community on each soil—is listed by common name. The expected percentage of the total annual production is given for each species making up the characteristic vegetation. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the potential natural plant community. Further information about the range similarity index and rangeland trend is available in chapter 4 of the "National Range and Pasture Handbook" (http://www.ftw.nrcs.usda.gov/glti/NRPH.html).

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Forest Land

Forest Land Productivity

The table "Forest Land Productivity" at the end of this section can help woodland owners or forest managers plan the use of soils for wood crops. Only those soils suitable for wood crops are listed.

In the table, the *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as *volume* numbers. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *volume of wood fiber* is the yield likely to be produced by the most important trees. This number, expressed as cubic meters per hectare per year, cubic feet per acre per year, and board feet per acre per year, indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It generally is the most common species on the soil and is the one that determines the ordination class.

Suggested trees to plant are those that are suitable for commercial wood production.

Forest Access Roads

The major management concerns affecting the use of the detailed soil map units in the survey area for forest access roads are listed in the table "Limitations and Hazards Affecting Forest Access Roads." The significance of each limitation or hazard and the criteria used to determine the limitation or hazard are described in this section.

Areas of rock outcrop and *depth to bedrock* can increase the cost of road construction and influence route planning. Constructing the roads is difficult because of the need for rock removal and for additional soil material to provide a suitable road surface.

Boulders can increase the cost of road construction and influence route planning. Construction is difficult mainly because of the need for extraction and disposal of the boulders.

Dustiness of the road surface material may cause safety problems and accelerate equipment wear. Dust-abatement measures are needed during dry periods.

The erodibility of the soil material in the roadbed influences the probability of *water erosion* resulting from the channeling of runoff in the roadway. Erosion can result in the sedimentation of streams. It can be controlled by reducing road grades and controlling runoff onto and off of the road surface through the installation of drainage measures.

Flooding in the area where a road is constructed may restrict use, result in damage to the roadway, and result in the sedimentation of waterways. The hazard of flooding can be reduced by installing a drainage system, elevating the roadbed, and using riprap and diversions.

Low soil strength of the soil material used to construct the road surface can result in rutting, in drainage problems, and in poor trafficability during wet periods. The road should be used only during dry periods or when the surface is frozen. Surfacing with material of suitable strength and installing a drainage system can help to overcome this limitation.

Roadbed material that has a high *shrink-swell potential* shrinks and swells markedly during dry and wet periods. Excessive shrinking and swelling can damage the road surface or other features, such as bridge abutments, culverts, and erosion-control structures.

A steep *slope* results in increased construction and maintenance costs and increased sedimentation because of the large cuts necessary to create an adequate roadbed. Seeding the cut slope to suitable vegetation minimizes sedimentation. Large cuts can increase instability of the slope. Where slumping is a hazard, slope failure can become a significant maintenance and environmental problem. Areas where the slope is steep should not be used as sites for roads.

Slumping causes safety problems and increases maintenance costs. Frequent clearing of slumped soil

in the roadbed or rebuilding of the roadway may be needed to keep the road serviceable and drainage systems functioning.

Stones cause problems in maintaining a smooth road surface that has good trafficability. Unless the stones are removed, additions of suitable stone-free material may be needed when the road is surfaced.

Roads built across soils that have a *water table* may require substantial ballast, fabric, internal drainage systems, and other measures that maintain a road surface that has good trafficability. Construction and use of the road only during periods when the water table is not near the surface or when the road is frozen can help to maintain trafficability and reduce the potential for site damage.

Explanation of Criteria

Areas of rock outcrop.—Rock outcrop is a named component of the map unit.

Areas of rubble land.—Rubble land is a named component of the map unit.

Boulders.—The terms describing the texture within a depth of 24 inches include a bouldery modifier, or the soil is a bouldery phase.

Depth to rock.—Hard bedrock is within a depth of 60 inches.

Dustiness.—The surface layer is silt, silt loam, loam, or very fine sandy loam.

Erosion by water.—The K factor of the surface layer multiplied by the upper slope limit is more than 10.

Flooding.—The component of the map unit is occasionally flooded or frequently flooded.

Low soil strength.—The component of the map unit has one of the following Unified classifications within the 60-inch profile: ML, CL, MH, CH, OL, PT, or GC.

Shrink-swell potential.—The component of the map unit has a high shrink-swell potential in a layer that is at least 10 inches thick and is within 40 inches of the surface.

Slope.—The upper slope limit is more than 35 percent.

Slumping.—The component of the map unit meets the requirements for low soil strength and has slopes of more than 35 percent.

Stones.—The terms describing the texture within a depth of 24 inches include a very stony or extremely stony modifier, or the soil is a very stony or extremely stony phase.

Water table.—The component of the map unit has a water table within a depth of 60 inches.

General Land Management

This section provides interpretations applicable across a wide spectrum of land uses. These interpretations reflect the hazard of soil degradation resulting from erosion in areas of exposed soil, the risk of damage during the development of unsurfaced roads, the risk of damage caused by fire, and the hazard of soil rutting when the soil is subject to traffic in moist or wet conditions. The ratings are given in the table "Land Management" at the end of this section.

Ratings in the column *hazard of off-road erosion* are based on slope and on soil erodibility factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by such disturbances as traffic, logging, grazing, or mining. The hazard is described as slight, moderate, severe, or very severe. A rating of *slight* indicates that erosion is unlikely under ordinary climatic conditions; *moderate* indicates that some erosion is likely and that erosion-control measures may be needed; *severe* indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and *very severe* indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.

Ratings in the column *hazard of erosion on roads* are based on the soil erodibility factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Ratings in the column *potential for damage to soil by fire* are based on texture of the surface layer, content of rock fragments and organic matter in the surface layer, thickness of the surface layer, and slope. The soils are described as having a low, moderate, or high potential for this kind of damage. The ratings indicate an evaluation of the potential impact of prescribed fires or wildfires that are intense enough to remove a duff layer and consume organic matter in the surface layer.

Ratings in the column *soil rutting hazard* are based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of equipment or vehicle operation under moist or wet soil conditions. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that the soil is subject to little or no rutting, *moderate* indicates that rutting is likely, and *severe* indicates that ruts form readily.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, construction materials, and water management. The ratings are based on observed performance of the soils and on the data in the tables described under the heading "Soil Properties."

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for septic tank absorption fields; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. The table "Building Site Development" at the end of this section shows the degree and kind of soil limitations that affect septic tank absorption fields and dwellings with and without basements.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that

are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Waste Management

Soil properties are important when organic waste is applied as fertilizer and wastewater is applied in irrigated areas. They also are important when the soil is used as a medium for the treatment and disposal of the organic waste and wastewater. Unfavorable soil properties can result in environmental damage.

The use of organic waste and wastewater as production resources results in energy and resource conservation and minimizes the problems associated with waste disposal. If disposal is the goal, applying a maximum amount of the organic waste or the wastewater to a minimal area holds costs to a minimum and environmental damage is the main hazard. If reuse is the goal, a minimum amount should be applied to a maximum area and environmental damage is unlikely.

Interpretations developed for waste management may include ratings for manure- and food-processing waste, municipal sewage sludge, use of wastewater for irrigation, and treatment of wastewater by slow rate, overland flow, and rapid infiltration processes.

Specific information regarding waste management is available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Construction Materials

The table “Construction Material Potential” at the end of this section provides information about the soils as potential sources of gravel, sand, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

The numerical ratings in the table are percentages indicating the probability that the soil is a source of the material.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the table, only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the

bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Water Management

The “Water Management” table at the end of this section provides information on the soil properties and site features that affect water management. Ratings are given for constructing grassed waterways, vegetating grassed waterways and filter strips, and irrigating using a sprinkler method. The ratings in the table are both verbal and numerical.

Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Grassed waterways are natural or constructed channels, generally broad and shallow, that are seeded with erosion-resistant sod-forming grasses. They are used to conduct surface water to outlets at a nonerosive velocity and help to contain and absorb water-borne materials.

Filter strips are strips of permanent vegetation that retard the flow of runoff water. They are established above farm ponds, diversion terraces, and other structures.

The soil properties and qualities that affect the construction and maintenance of grassed waterways are permeability, large stones, slope, depth to the water table, and depth to bedrock or a cemented pan. The soil properties and qualities that affect the growth and maintenance of vegetation after construction are moisture regime, susceptibility to soil blowing or water erosion, available water capacity, rooting depth, salinity, sodicity, and permeability.

Sprinkler irrigation is the controlled application of water to supplement rainfall and support plant growth. The soil properties and qualities important in the design and management of sprinkler irrigation systems include the sodium adsorption ratio, the depth to a seasonal high water table, the available water capacity, permeability, wind erodibility, erosion factor K, slope, and flooding. Soil properties and qualities

that influence the installation of a sprinkler irrigation system include surface rock fragments, surface topography, and slope. Soil properties that affect the performance of sprinkler irrigation systems include the depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, and soil reaction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are ascertained by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Index Properties

The table "Engineering Index Properties" at the end of this section gives the engineering classifications and the range of index properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2001) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2000).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area

and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of particle-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is generally omitted in the table.

Physical Properties

The table "Physical Properties of the Soils" at the end of this section shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$- or $^1/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

K_{sat} (permeability) refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (K_{sat}). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low,* a change of less than 3 percent; *moderate,* 3 to 6 percent; *high,* 6 to 9 percent; and *very high,* more than 9 percent.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the

table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to soil blowing in cultivated areas. The soils assigned to group 1 are the most susceptible to soil blowing, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.
8. Soils that are not subject to soil blowing because of rock fragments on the surface or because of surface wetness.

Wind erodibility index is a numerical value indicating the susceptibility of soil to soil blowing, or the tons per acre per year that can be expected to be lost to soil blowing. There is a close correlation between soil blowing and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence soil blowing.

Chemical Properties

The table “Chemical Properties of the Soils” at the end of this section shows estimates of some chemical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

Soil reaction is a measure of acidity or alkalinity. The pH of each soil horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

Water Features

The table “Water Features” at the end of this section gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means

that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

The table "Soil Features" at the end of this section gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

In the table, *restrictions* refer to a restrictive layer in the soil—a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the thickness of the restrictive layer, which significantly affects the ease of excavation. *Depth* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

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Glossary

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. See Sodic (alkali) soil.

Alluvial fan. A body of alluvium, with overflow of water and debris flow deposits, whose surface forms a segment of a cone that radiates downslope from the point where the stream emerges from a narrow valley onto a less sloping surface. Source uplands range in relief and area extent from mountains to gullied terrains on hillslopes.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Argillite. Weakly metamorphosed mudstone or shale.

Aspect. The direction in which a slope faces.

Association, soil. A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3.75
Low	3.75 to 5.0
Moderate	5.0 to 7.5
High	more than 7.5

Avalanche chute. The track or path formed by an avalanche.

Backslope. The geomorphic component that forms the steepest inclined surface and principal element of many hillslopes. Backslopes in profile are commonly steep and linear and descend to a footslope. In terms of gradational process, backslopes are erosional forms produced mainly by mass wasting and running water.

Badland. Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badland is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

Basal area. The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Base slope. A geomorphic component of hills consisting of the concave to linear (perpendicular to the contour) slope that, regardless of the lateral shape, forms an apron or wedge at the bottom of a hillside dominated by colluvium and slope-wash sediments (for example, slope alluvium).

Bedding planes. Fine strata, less than 5 millimeters

thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediment.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-floored plain. An extensive nearly level to gently rolling or moderately sloping area that is underlain by hard bedrock and has a slope of 0 to 8 percent.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Board foot. A unit of measure of the wood in lumber, logs, or trees. The amount of wood in a board 1 foot wide, 1 foot long, and 1 inch thick before finishing.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Bouldery. Refers to a soil in an area where 0.01 to 0.1 percent of the surface is covered with boulders.

Bouldery soil material. Soil that is 15 to 35 percent, by volume, rock fragments that are dominantly larger than 24 inches (60 centimeters) in diameter.

Breaks. The steep and very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height. An average height of 4.5 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the hazard of erosion. It can improve the habitat for some species of wildlife.

Cable yarding. A method of moving felled trees to a nearby central area for transport to a processing facility. Most cable yarding systems involve use of a drum, a pole, and wire cables in an arrangement similar to that of a rod and reel used for fishing. To reduce friction and soil disturbance, felled trees generally are reeled in while one end is lifted or the entire log is suspended.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche. A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds directly beneath the solum, or it is exposed at the surface by erosion.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Channeled. Refers to a drainage area in which natural meandering or repeated branching and convergence of a streambed have created deeply incised cuts, either active or abandoned, in alluvial material.

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Cirque. A semicircular, concave, bowllike area that has steep faces primarily resulting from glacial ice and snow abrasion.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Clearcut. A method of forest harvesting that removes the entire stand of trees in one cutting. Reproduction is achieved artificially or by natural seeding from the adjacent stands.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Closed depression. A low area completely surrounded by higher ground and having no natural outlet.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

Codominant trees. Trees whose crowns form the general level of the forest canopy and that receive full light from above but comparatively little from the sides.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Commercial forest. Forestland capable of producing 20 cubic feet or more per acre per year at the culmination of the mean annual increment.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conglomerate. A coarse grained, clastic rock composed of rounded or subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer textured material. Conglomerate is the consolidated equivalent of gravel.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Consolidated sandstone. Sandstone that disperses within a few hours when fragments are placed in water. The fragments are extremely hard or very hard when dry, are not easily crushed, and cannot be textured by the usual field method.

Consolidated shale. Shale that disperses within a few hours when fragments are placed in water. The fragments are extremely hard or very hard when dry and are not easily crushed.

Contour stripcropping. Growing crops in strips that

follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Dip slope. A slope of the land surface, roughly determined by and approximately conforming to the dip of the underlying bedrock.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Divided-slope farming. A form of field stripcropping in which crops are grown in a systematic arrangement of two strips, or bands, across the slope to reduce the hazard of water erosion. One strip is in a close-growing crop that provides protection from erosion, and the other strip is in a crop that provides less protection from erosion. This practice is used where slopes are not long enough to permit a full stripcropping pattern to be used.

Dominant trees. Trees whose crowns form the general level of the forest canopy and that receive full light from above and from the sides.

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainageway. An area of ground at a lower elevation than the surrounding ground and in which water collects and is drained to a closed depression or lake or to a drainageway at a lower elevation. A drainageway may or may not have distinctly incised channels at its upper reaches or throughout its course.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

Dune. A mound, ridge, or hill of loose, windblown granular material (generally sand), either bare or covered with vegetation.

Ecological site. An area where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. An ecological site is the

product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other ecological sites in kind and/or proportion of species or in total production.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Esker. A long, narrow, sinuous, steep-sided ridge composed of irregularly stratified sand and gravel that were deposited by a subsurface stream flowing between ice walls or through ice tunnels of a retreating glacier and that were left behind when the ice melted. Eskers range from less than a mile to more than 100 miles in length and from 10 to 100 feet in height.

Even aged. Refers to a stand of trees in which only small differences in age occur between individual trees. A range of 20 years is allowed.

Extrusive rock. Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grain is grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.

Fine textured soil. Sandy clay, silty clay, or clay.

Firebreak. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of firefighters and equipment. Designated roads also serve as firebreaks.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Fluvial. Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foothill. A steeply sloping upland that has relief of as

much as 1,000 feet (300 meters) and fringes a mountain range or high-plateau escarpment.

Footslope. The geomorphic component that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. In terms of gradational processes, a footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Giant ripple mark. The undulating surface sculpture produced in noncoherent granular materials by currents of water and by the agitation of water in wave action during the drainage of large glacial lakes, such as Glacial Lake Missoula.

Glacial drift. Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciated uplands. Land areas that were previously covered by continental or alpine glaciers and that are at a higher elevation than the flood plain.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter. Very gravelly soil is 35 to 60 percent gravel, and extremely gravelly soil is more than 60 percent gravel.

Grazeable forestland. Land capable of sustaining livestock grazing by producing forage of sufficient quantity during one or more stages of secondary forest succession.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Grus. The fragmental products of in-situ granular disintegration of granite and granitic rocks.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Gypsum. A mineral consisting of hydrous calcium sulfate.

Habitat type. An aggregation of all land areas capable of producing similar climax plant communities.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Head out. To form a flower head.

Head slope. A geomorphic component of hills

consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

Heavy metal. Inorganic substances that are solid at ordinary temperatures and are not soluble in water. They form oxides and hydroxides that are basic. Examples are copper, iron, cadmium, zinc, manganese, lead, and arsenic.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Hill. A natural elevation of the land surface, rising as much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the "Soil Survey Manual." The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be

limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame. An irregular, short ridge or hill of stratified glacial drift.

Kame terrace. A terracelike ridge consisting of stratified sand and gravel that were deposited by a meltwater stream flowing between a melting glacier and a higher valley wall or lateral moraine and that remained after the disappearance of the ice. It is commonly pitted with kettles and has an irregular ice-contact slope.

K_{sat}. Saturated hydraulic conductivity. (See Permeability.)

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake plain. A surface marking the floor of an extinct lake, filled in by well sorted, stratified sediments.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Lateral moraine. A ridgelike moraine carried on and deposited at the side margin of a valley glacier. It is composed chiefly of rock fragments derived from the valley walls by glacial abrasion and plucking or by mass wasting.

Leaching. The removal of soluble material from soil or other material by percolating water.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loamy soil. Coarse sandy loam, sandy loam, fine sandy loam, very fine sandy loam, loam, silt loam, silt, clay loam, sandy clay loam, or silty clay loam.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

Low strength. The soil is not strong enough to support loads.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

Mean annual increment (MAI). The average annual increase in volume of a tree during its entire life.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Merchantable trees. Trees that are of sufficient size to be economically processed into wood products.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Microhigh. An area that is 2 to 12 inches higher than the adjacent microlow.

Microlow. An area that is 2 to 12 inches lower than the adjacent microhigh.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Natric horizon. A special kind of argillic horizon that contains enough exchangeable sodium to have an adverse effect on the physical condition of the subsoil.

Naturalized pasture. Forestland that is used primarily for the production of forage for grazing by livestock rather than for wood products. Overstory trees are removed or managed in a way that promotes the native and introduced understory vegetation on the site. This vegetation is managed for its forage value through the application of grazing management principles.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium,

magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Overstory. The trees in a forest that form the upper crown cover.

Oxbow. The horseshoe-shaped channel of a former meander, remaining after the stream formed a cutoff across a narrow meander neck.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable	less than 0.0015 inch
Very slow	0.0015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Playa. The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Potential natural community (PNC). The biotic community that would become established on an ecological site if all successional sequences were completed without interference by human activities under the present environmental conditions. Natural disturbances are inherent in its development. The PNC may include acclimatized or naturalized nonnative species.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Quartzite, metamorphic. Rock consisting mainly of quartz that formed through recrystallization of quartz-rich sandstone or chert.

Quartzite, sedimentary. Very hard but unmetamorphosed sandstone consisting chiefly of quartz grains.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. (See Similarity index.)

Range site. See Ecological site.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Recessional moraine. A moraine formed during a temporary but significant halt in the retreat of a glacier.

Red beds. Sedimentary strata that are mainly red and are made up largely of sandstone and shale.

Redox concentrations. See Redoximorphic concentrations.

Redox depletions. See Redoximorphic depletions.

Redox features. See Redoximorphic features.

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

Regeneration. The new growth of a natural plant community, developing from seed.

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relict stream terrace. One of a series of platforms in or adjacent to a stream valley that formed prior to the current stream system.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and not wide enough to be an obstacle to farm machinery.

Riser. The relatively short, steeply sloping area below a terrace tread that grades to a lower terrace tread or base level.

Road cut. A sloping surface produced by mechanical

means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Salinity. The electrical conductivity of a saline soil. It is expressed, in millimhos per centimeter, as follows:

Nonsaline	0 to 4
Slightly saline	4 to 8
Moderately saline	8 to 16
Strongly saline	more than 16

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sandy soil. Sand or loamy sand.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Sawlogs. Logs of suitable size and quality for the production of lumber.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Scribner's log rule. A method of estimating the number of board feet that can be cut from a log of a given diameter and length.

Sedimentary plain. An extensive nearly level to gently rolling or moderately sloping area that is underlain by sedimentary bedrock and that has a slope of 0 to 8 percent.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Sedimentary uplands. Land areas of bedrock formed from water- or wind-deposited sediments. They are higher on the landscape than the flood plain.

Semiconsolidated sedimentary beds. Soft geologic sediments that disperse when fragments are placed in water. The fragments are hard or very hard when dry. Determining the texture by the usual field method is difficult.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner,

and have similar conservation needs or management requirements for the major land uses in the survey area.

Similarity index. The percentage of a specific vegetation-state plant community that is presently on the site.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Skid trails. Pathways along which logs are dragged to a common site for loading onto a logging truck.

Slash. The branches, bark, treetops, reject logs, and broken or uprooted trees left on the ground after logging.

Slickens. Accumulations of fine textured material, such as that separated in placer-mine and ore-mill operations. Slickens from ore mills consist largely of freshly ground rock that commonly has undergone chemical treatment during the milling process. Slickens are commonly confined in a specially constructed basin.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey the following slope classes are recognized:

Nearly level	0 to 2 percent
Gently sloping	2 to 4 percent
Moderately sloping	4 to 8 percent
Strongly sloping	8 to 15 percent
Moderately steep	15 to 25 percent
Steep	25 to 45 percent
Very steep	more than 45 percent

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specified use.

Sodic (alkali) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^{+} to $Ca^{++} + Mg^{++}$. The degrees of sodicity and their respective ratios are:

Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Sodium adsorption ratio (SAR). A measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration.

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage. In an area of stony soil, stones cover 0.01 to 0.1 percent of the surface. Very stony means that stones cover 0.1 to

3.0 percent of the surface, and extremely stony means that stones cover 3 to 15 percent of the surface.

Strath terrace. A type of stream terrace, formed as an erosional surface cut on bedrock and thinly mantled with stream deposits (alluvium).

Stream channel. The hollow bed where a natural stream of surface water flows or may flow; the deepest or central part of the bed, formed by the main current and covered more or less continuously by water.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Tailwater. The water directly downstream from a structure.

Talus. Fragments of rock and other soil material accumulated by gravity at the foot of cliffs or steep slopes.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Terracette. A small, irregular, steplike form on steep hillslopes, especially in pasture, formed by creep or erosion of surficial materials that may or may not be induced by trampling of livestock.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Till plain. An extensive nearly level to gently rolling or moderately sloping area that is underlain by or consists of till and that has a slope of 0 to 8 percent.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a

hillslope continuum that grades to valley or closed-depression floors.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Trafficability. The degree to which a soil is capable of supporting vehicular traffic across a wide range in soil moisture conditions.

Tread. The relatively flat terrace surface that was cut or built by stream or wave action.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Understory. Any plants in a forest community that grow to a height of less than 5 feet.

Upland. Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley. An elongated depressional area primarily developed by stream action.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer or a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

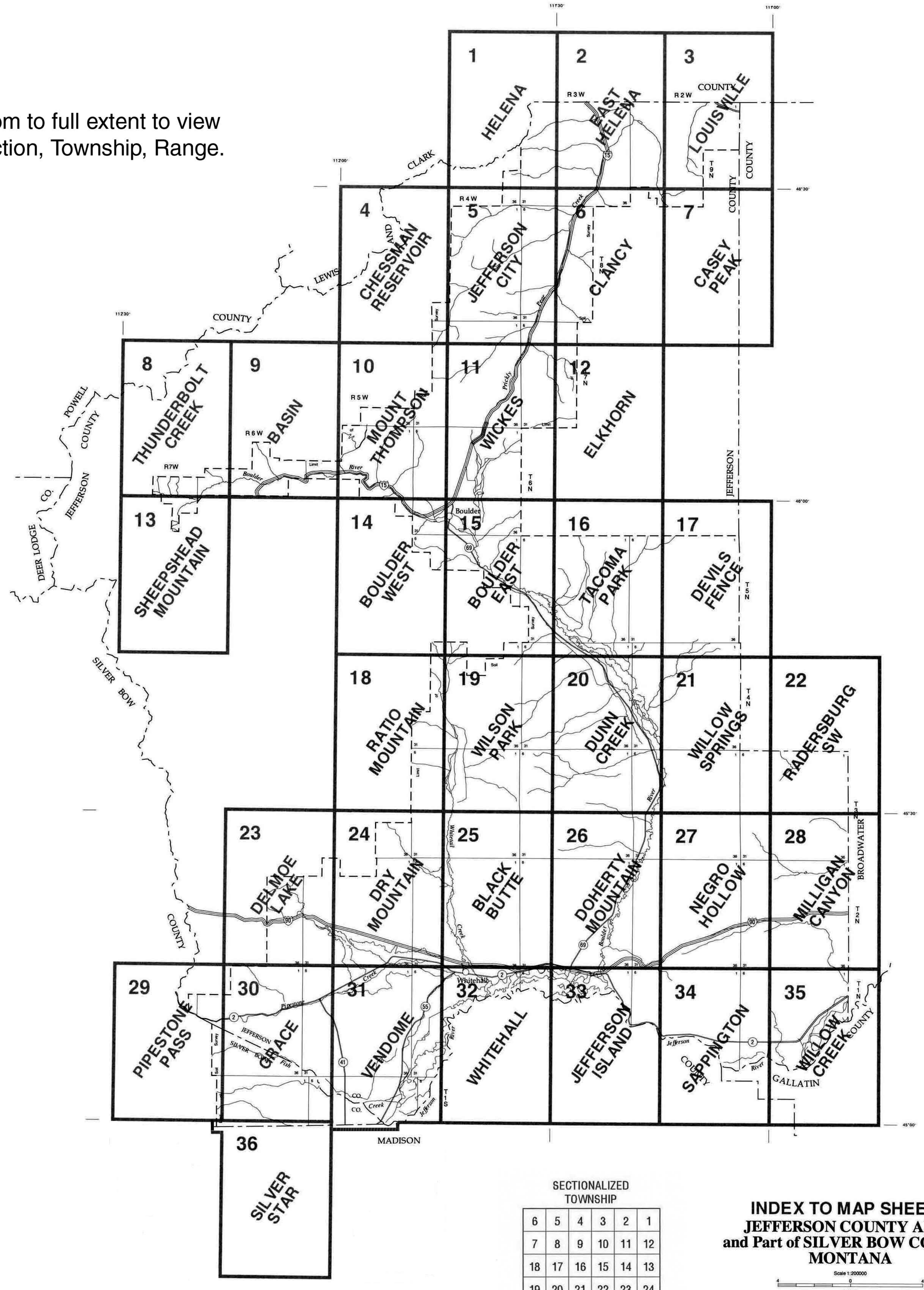
Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Windthrow. The uprooting and tipping over of trees by the wind.

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Zoom to full extent to view
Section, Township, Range.



SECTIONALIZED
TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

INDEX TO MAP SHEETS
JEFFERSON COUNTY AREA and Part of SILVER BOW COUNTY MONTANA

Scale 1:200000

4 0 4
MILES

8 0 8
KILOMETERS

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

JEFFERSON COUNTY AREA AND PART OF SILVER BOW COUNTY, MONTANA

UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT
MONTANA AGRICULTURAL EXPERIMENT STATION

SOIL LEGEND

Map symbols consist of numbers, letters, or a combination of numbers and letters. In the symbols that consist of a combination of numbers and letters, such as 20C or 1823F, the number designates the type of soil and the letter identifies a slope class. Numerical symbols that do not include a letter for slope class are for miscellaneous areas.

SYMBOL	NAME
1	Riverwash
2	Rubble land-Rock outcrop association
3	Dumps, mine
4	Bronec, Clunton, channeled, and Amesha soils, 0 to 8 percent slopes
5	Borrow areas and gravel pits
6	Wetsand, Cardwell, and Clunton soils, 0 to 2 percent slopes, channeled
9	Bronec, Riverrun, channeled, and Amesha soils, 0 to 8 percent slopes
11B	Amesha silt loam, 1 to 4 percent slopes
11C	Amesha silt loam, 4 to 8 percent slopes
11D	Amesha silt loam, 8 to 15 percent slopes
13A	Anamac loam, 0 to 2 percent slopes
13C	Anamac loam, 2 to 8 percent slopes
18A	Brocko silt loam, 0 to 2 percent slopes
18C	Brocko silt loam, 2 to 8 percent slopes
18D	Brocko silt loam, 8 to 15 percent slopes
18E	Brocko silt loam, 15 to 35 percent slopes
20C	Windham gravelly loam, 2 to 8 percent slopes
20D	Windham gravelly loam, 8 to 15 percent slopes
20E	Windham very gravelly loam, 15 to 35 percent slopes
21A	Mckenton silty clay loam, 0 to 2 percent slopes
22C	Zatony clay loam, 2 to 8 percent slopes
23A	Mckenton silt loam, 0 to 2 percent slopes
25C	Cozberg sandy loam, 2 to 8 percent slopes
26C	Crago gravelly loam, 2 to 8 percent slopes
26D	Crago gravelly loam, 8 to 15 percent slopes
26E	Crago gravelly loam, 15 to 25 percent slopes
27A	Bronec gravelly loam, 0 to 2 percent slopes
27C	Bronec gravelly loam, 2 to 8 percent slopes
27D	Bronec gravelly loam, 8 to 15 percent slopes
27E	Bronec gravelly loam, 15 to 35 percent slopes
30A	Dougcliff mucky peat, 0 to 1 percent slopes
32A	Fairway silt loam, 0 to 2 percent slopes
33E	Geohrock cobbly clay loam, 15 to 35 percent slopes, stony
37A	Pieriver silt loam, 0 to 2 percent slopes
38C	Kalsted sandy loam, 2 to 8 percent slopes
38D	Kalsted sandy loam, 8 to 15 percent slopes
40A	Moltoner loam, 0 to 2 percent slopes
41	Bronec, Amesha, and Riverrun, channeled, soils, 0 to 35 percent slopes
42D	Perma cobbly loam, 4 to 15 percent slopes, stony
42E	Perma cobbly loam, 15 to 25 percent slopes, stony
47A	Cardwell silty clay loam, 0 to 2 percent slopes
48A	Riverrun sandy loam, 0 to 2 percent slopes
52A	Ryell loam, 0 to 2 percent slopes
53C	Sappington gravelly clay loam, 2 to 8 percent slopes
56A	Trudau loam, 0 to 2 percent slopes
56B	Trudau loam, 2 to 8 percent slopes
60C	Watne loam, 2 to 8 percent slopes
64A	Varney sandy clay loam, 0 to 2 percent slopes
64C	Varney sandy clay loam, 2 to 8 percent slopes
65C	Judell loam, 2 to 8 percent slopes
68D	Bondoe channery loam, 4 to 15 percent slopes
69A	Meadowcreek silty clay loam, 0 to 2 percent slopes
71C	Raghorn sandy loam, 4 to 8 percent slopes
71D	Raghorn sandy loam, 8 to 15 percent slopes
72F	Zbart-Rock outcrop association, 25 to 70 percent slopes
73C	Martinsdale loam, 2 to 8 percent slopes
74D	Shawmut gravelly loam, 4 to 15 percent slopes, bouldery
75C	Sixbeacon loam, 2 to 8 percent slopes
76A	Absay silty clay loam, 0 to 4 percent slopes
77F	Rock outcrop-Pensore, stony-Crago, stony, association, 25 to 60 percent slopes
79A	Chinook sandy loam, 0 to 2 percent slopes
79C	Chinook sandy loam, 2 to 8 percent slopes
79D	Chinook sandy loam, 8 to 15 percent slopes
79E	Chinook sandy loam, 15 to 25 percent slopes
80A	Floweree silt loam, 0 to 2 percent slopes
80C	Floweree silt loam, 2 to 8 percent slopes
81A	Ethridge clay loam, 0 to 2 percent slopes
81C	Ethridge clay loam, 2 to 8 percent slopes
82C	Rothiemay very gravelly loam, 2 to 8 percent slopes
83C	Shoddy silty clay loam, 2 to 8 percent slopes
83D	Shoddy silty clay loam, 8 to 15 percent slopes
84A	Clunton-Faith-Dougcliff complex, 1 to 4 percent slopes
85D	Walbert coarse sandy loam, 4 to 15 percent slopes
87C	Kobarter clay loam, 2 to 8 percent slopes
87D	Kobarter clay loam, 8 to 15 percent slopes
88C	Lahood loam, 2 to 8 percent slopes
88D	Lahood loam, 8 to 15 percent slopes
92D	Clunton, Cometcrik, and Perma, stony, soils, 0 to 15 percent slopes
99D	Libeg gravelly loam, 4 to 15 percent slopes, bouldery
99E	Libeg very gravelly loam, 15 to 35 percent slopes, bouldery
113C	Amesha-Amesha, stony, complex, 2 to 8 percent slopes
113D	Amesha-Amesha, stony, complex, 8 to 15 percent slopes
114D	Amesha-Crago-Shoddy complex, 4 to 15 percent slopes
114E	Amesha-Crago-Shoddy complex, 15 to 45 percent slopes
115A	Amesha gravelly loam, 0 to 2 percent slopes
115C	Amesha gravelly loam, 2 to 8 percent slopes
115D	Amesha gravelly loam, 8 to 15 percent slopes
115E	Amesha gravelly loam, 15 to 35 percent slopes
116A	Amesha loam, 0 to 2 percent slopes
116C	Amesha loam, 2 to 8 percent slopes
116D	Amesha loam, 8 to 15 percent slopes
117E	Amesha-Cabbart-Bronec cobbly loams, 4 to 25 percent slopes
118C	Amesha cobbly loam, 2 to 8 percent slopes
121E	Maiden-Lap-Rock outcrop complex, 15 to 35 percent slopes

SYMBOL	NAME
121F	Maiden-Lap-Rock outcrop complex, 35 to 60 percent slopes
122D	Maiden-Lap-Windham complex, 4 to 15 percent slopes
122E	Maiden-Lap-Windham complex, 15 to 35 percent slopes
122F	Maiden-Lap-Windham complex, 35 to 60 percent slopes
123E	Maiden, very stony-Rock outcrop-Lap, very stony, complex, 8 to 35 percent slopes
123F	Maiden, very stony-Rock outcrop-Lap, very stony, complex, 35 to 60 percent slopes
125D	Maiden-Lap-Windham complex, 4 to 15 percent slopes, warm
125E	Maiden-Lap-Windham complex, 15 to 35 percent slopes, warm
126F	Maiden, very stony-Rock outcrop-Lap, very stony, complex, 15 to 60 percent slopes, warm
132A	Anamac silt loam, 0 to 2 percent slopes, saline
151D	Delpoint-Abor complex, 4 to 15 percent slopes
171D	Branham-Opitz-Tuggle complex, 2 to 15 percent slopes
171E	Branham-Opitz-Tuggle complex, 15 to 35 percent slopes
172D	Branham-Clugulch-Rock outcrop complex, 2 to 15 percent slopes
172E	Branham-Clugulch-Rock outcrop complex, 15 to 35 percent slopes
173F	Branham, stony-Tuggle, very stony-Rock outcrop complex, 35 to 60 percent slopes
182D	Brocko-Amesha complex, 4 to 15 percent slopes
183E	Brocko-Rock outcrop-Rencot complex, 8 to 35 percent slopes
184E	Brocko-Rock outcrop-Bronec, very stony, complex, 15 to 45 percent slopes
191C	Cabbart-Shoddy-Amesha complex, 2 to 8 percent slopes
191D	Cabbart-Shoddy-Amesha complex, 8 to 15 percent slopes
191E	Cabbart-Shoddy-Amesha complex, 15 to 45 percent slopes
192C	Cabbart clay loam, 2 to 8 percent slopes
193E	Cabbart-Haxby loams, 8 to 45 percent slopes
194E	Cabbart-Bronec, stony-Rencot, very stony, complex, 8 to 25 percent slopes
195E	Cabbart, very stony-Bronec, stony-Rock outcrop complex, 8 to 35 percent slopes
195F	Cabbart, very stony-Rock outcrop-Bronec, very stony, complex, 25 to 60 percent slopes
201E	Windham-Rock outcrop-Lap, very stony, complex, 8 to 35 percent slopes
201F	Windham, very stony-Rock outcrop-Lap, very stony, complex, 35 to 70 percent slopes
202D	Windham-Judell complex, 8 to 15 percent slopes
202E	Windham-Judell complex, 15 to 35 percent slopes
203D	Windham gravelly loam, 4 to 15 percent slopes, stony
203E	Windham gravelly loam, 15 to 35 percent slopes, stony
204D	Windham-Maiden-Lap complex, 4 to 15 percent slopes
204E	Windham, stony-Maiden, very stony-Lap, very stony, complex, 15 to 35 percent slopes
204F	Windham, very stony-Maiden, very stony-Rock outcrop complex, 25 to 60 percent slopes
205E	Windham very cobbly loam, 4 to 35 percent slopes, very stony
205F	Windham very cobbly loam, 35 to 60 percent slopes, very stony
206F	Windham-Windham, stony, complex, 15 to 70 percent slopes
207E	Windham, stony-Lap, very stony-Rock outcrop complex, 15 to 35 percent slopes
207F	Windham, stony-Lap, very stony-Rock outcrop complex, 35 to 70 percent slopes
208D	Windham-Judell gravelly loams, 8 to 25 percent slopes, stony
211A	Clunton silty clay loam, 0 to 2 percent slopes
221A	Zatony clay loam, 0 to 2 percent slopes, wet
231A	Ledger-Moltoner-Mckenton complex, 0 to 2 percent slopes
232A	Clunton-Wetsand-Bonebasin complex, 0 to 2 percent slopes
233A	Ledger-Wetsand, saline, complex, 0 to 2 percent slopes
241E	Whitlash, very stony-Rock outcrop-Perma, stony, complex, 2 to 25 percent slopes
241F	Whitlash, very stony-Rock outcrop-Perma, very stony, complex, 25 to 60 percent slopes
245E	Tolbert, very stony-Rock outcrop-Absarook, stony, complex, 8 to 35 percent slopes
251B	Cozberg sandy loam, 1 to 4 percent slopes, stony
251D	Cozberg sandy loam, 4 to 15 percent slopes, stony
261D	Crago-Brocko complex, 4 to 15 percent slopes
261E	Crago-Brocko complex, 15 to 60 percent slopes
263D	Crago-Rock outcrop-Pensore complex, 4 to 25 percent slopes
263F	Crago, stony-Rock outcrop-Pensore, stony, complex, 25 to 60 percent slopes
264C	Crago-Amesha complex, 2 to 8 percent slopes
264D	Crago-Amesha complex, 8 to 15 percent slopes
264E	Crago-Amesha complex, 15 to 35 percent slopes
264F	Crago-Amesha complex, 35 to 60 percent slopes
265B	Crago gravelly loam, 1 to 4 percent slopes, stony
265D	Crago gravelly loam, 4 to 15 percent slopes, stony
265E	Crago very cobbly loam, 15 to 45 percent slopes, very stony
266D	Crago, stony-Crago complex, 4 to 15 percent slopes
266E	Crago, stony-Crago complex, 15 to 45 percent slopes
267F	Crago, very stony-Pensore, stony-Rock outcrop complex, 25 to 60 percent slopes
268C	Crago-Amesha cobbly loams, 2 to 8 percent slopes
269D	Crago, very stony, and Crago, rubbly, soils, 2 to 15 percent slopes
271C	Bronec-Amesha complex, 2 to 8 percent slopes
271D	Bronec-Amesha complex, 8 to 15 percent slopes
271E	Bronec-Amesha complex, 15 to 35 percent slopes
271F	Bronec-Amesha-Rock outcrop complex, 35 to 60 percent slopes
272E	Bronec-Geohrock-Rock outcrop complex, 15 to 45 percent slopes
273D	Bronec-Shoddy-Amesha complex, 4 to 15 percent slopes
273E	Bronec-Shoddy-Amesha complex, 15 to 35 percent slopes
274A	Bronec complex, 0 to 2 percent slopes
274C	Bronec complex, 2 to 8 percent slopes
274D	Bronec complex, 8 to 15 percent slopes
274E	Bronec-Bronec, very stony, complex, 15 to 45 percent slopes
275A	Bronec gravelly loam, 1 to 4 percent slopes, stony
275D	Bronec very gravelly loam, 4 to 15 percent slopes, very stony
275E	Bronec very gravelly loam, 15 to 35 percent slopes, very stony
276C	Bronec gravelly loam, 2 to 8 percent slopes, saline
277C	Bronec-Amesha cobbly loams, 2 to 8 percent slopes
278E	Bronec-Rencot-Rock outcrop complex, 15 to 45 percent slopes
291C	Sieben complex, 2 to 8 percent slopes
292C	Sieben-Varney cobbly loams, 2 to 8 percent slopes

SYMBOL	NAME
293D	Sieben cobbly loam, 4 to 15 percent slopes, stony
294C	Sieben, stony-Sieberell, very stony, complex, 2 to 15 percent slopes
295D	Sieben cobbly loam, 4 to 15 percent slopes, bouldery
296D	Sieberell-Sieben-Beaverell complex, 4 to 15 percent slopes, stony
297D	Sieben, very stony-Sieben, rubbly, complex, 2 to 25 percent slopes
297F	Sieben, rubbly-Sieben, very stony, complex, 15 to 60 percent slopes
311D	Beenom, stony-Wimper-Whitlash, very stony, complex, 4 to 15 percent slopes
311F	Beenom, stony-Wimper-Whitlash, very stony, complex, 15 to 45 percent slopes
321A	Fairway-Meadowcreek complex, 0 to 2 percent slopes
322A	Fairway loam, 0 to 2 percent slopes
323A	Fairway-Mckenton silt loams, 0 to 2 percent slopes
324A	Fairway clay loam, 0 to 2 percent slopes
325A	Fairway-Nestley clay loams, 0 to 2 percent slopes
326A	Fairway-Moltoner complex, 0 to 2 percent slopes
327A	Faith loam, 0 to 2 percent slopes
328A	Faith loam, 0 to 2 percent slopes, cool
329C	Faith-Slickens complex, 0 to 8 percent slopes, impacted
331C	Geohrock-Bronec gravelly loams, 2 to 8 percent slopes
331D	Geohrock-Bronec gravelly loams, 8 to 15 percent slopes
332D	Geohrock-Sappington complex, 4 to 15 percent slopes, stony
334D	Geohrock, stony-Bronec, very stony, complex, 4 to 15 percent slopes
341A	Pieriver-Cardwell-Riverrun loams, 0 to 2 percent slopes
342A	Handke fine sandy loam, 0 to 2 percent slopes
361D	Udecide-Varney-Walbert complex, 4 to 25 percent slopes
362C	Udecide-Varney sandy clay loams, 2 to 8 percent slopes
371A	Havre-Ryell-Handke complex, 0 to 2 percent slopes
372A	Havre loam, 0 to 2 percent slopes
381C	Kalsted gravelly sandy loam, 2 to 8 percent slopes
382D	Kalsted gravelly sandy loam, 4 to 15 percent slopes, stony
391C	Musselshell-Crago gravelly loams, 2 to 8 percent slopes
394B	Musselshell-Crago cobbly loams, 1 to 4 percent slopes
401A	Moltoner silty clay loam, 0 to 2 percent slopes
411A	Nestley loam, 0 to 2 percent slopes
413A	Nestley-Riverrun-Pieriver complex, 0 to 2 percent slopes
421E	Perma, stony-Whitlash, very stony, complex, 15 to 35 percent slopes
421F	Perma-Whitlash complex, 35 to 60 percent slopes, very stony
422F	Perma, very stony-Whitlash, very stony-Rock outcrop complex, 15 to 45 percent slopes, moist
423C	Wimper loam, 2 to 8 percent slopes
423D	Wimper loam, 8 to 15 percent slopes
423E	Wimper loam, 15 to 35 percent slopes
424D	Wimper-Wimper, stony, complex, 4 to 15 percent slopes
424E	Wimper-Wimper, stony, complex, 15 to 35 percent slopes
425E	Wimper gravelly loam, 8 to 35 percent slopes, stony
426F	Wimper-Whitlash association, 35 to 60 percent slopes
427E	Perma-Whitlash complex, 15 to 35 percent slopes, bouldery
429E	Perma, very stony-Perma, rubbly-Rock outcrop complex, 8 to 35 percent slopes
441F	Warneke-Warneke, very stony-Rock outcrop association, 8 to 60 percent slopes
451A	Geohrock cobbly clay loam, 1 to 4 percent slopes, stony
461D	Absarook-Beenom complex, 2 to 15 percent slopes
471A	Cardwell-Pieriver complex, 0 to 2 percent slopes
481A	Riverrun gravelly sandy loam, 0 to 2 percent slopes
482A	Riverrun-Cardwell complex, 0 to 2 percent slopes
483A	Riverrun, Handke, and Ryell soils, 0 to 2 percent slopes, channeled
492D	Roto-Pensore-Crago complex, 4 to 15 percent slopes
492E	Roto-Pensore-Crago complex, 15 to 35 percent slopes
492F	Roto-Pensore-Crago complex, 35 to 60 percent slopes, stony
493D	Pensore-Rock outcrop-Roto complex, 2 to 25 percent slopes
511C	Haxby-Amesha-Rencot complex, 4 to 15 percent slopes
521A	Cardwell-Riverrun complex, 0 to 2 percent slopes
522A	Ryell-Riverrun complex, 0 to 2 percent slopes
523A	Cardwell-Riverrun-Pieriver complex, 0 to 2 percent slopes
524A	Cardwell loam, 0 to 2 percent slopes
525A	Cardwell-Riverrun complex, 0 to 2 percent slopes, saline
531C	Sappington very cobbly clay loam, 2 to 8 percent slopes
532C	Sappington-Amesha complex, 2 to 8 percent slopes
533A	Sappington clay loam, 0 to 2 percent slopes
533C	Sappington clay loam, 2 to 8 percent slopes
533D	Sappington clay loam, 8 to 15 percent slopes
534C	Sappington-Geohrock complex, 2 to 8 percent slopes
534D	Sappington-Geohrock complex, 8 to 15 percent slopes
536A	Sappington-Amesha complex, 0 to 2 percent slopes
537B	Sappington loam, 1 to 4 percent slopes, stony
537D	Sappington loam, 4 to 15 percent slopes, stony
538C	Sappington gravelly loam, 2 to 8 percent slopes
539B	Sappington-Amesha complex, 2 to 8 percent slopes, cobbly
539C	Sappington-Amesha complex, 2 to 8 percent slopes, stony
541D	Whitlash, very stony-Brickner, stony-Rock outcrop complex, 4 to 25 percent slopes
541E	Whitlash, very stony-Brickner, stony-Rock outcrop complex, 25 to 60 percent slopes
551E	Brickner, stony-Whitlash, very stony-Rock outcrop complex, 35 to 60 percent slopes
552F	Brickner, very bouldery-Rock outcrop-Tolbert, very bouldery, association, 25 to 60 percent slopes
553F	Brickner, very stony-Wickes, very bouldery-Rock outcrop complex, 15 to 60 percent slopes
554F	Brickner, very stony-Rock outcrop-Mocmont, stony, complex, 25 to 60 percent slopes
562C	Trudau-Bronec, saline, complex, 2 to 8 percent slopes
564C	Trudau-Benz clay loams, 2 to 8 percent slopes
581E	Whitecow, stony-Warneke, very stony-Rock outcrop complex, 8 to 35 percent slopes
581F	Whitecow, very stony-Warneke, very stony-Rock outcrop complex, 35 to 70 percent slopes
582E	Whitecow, bouldery-Shawmut, very bouldery-Rock outcrop complex, 15 to 45 percent slopes, warm

SYMBOL	NAME
583E	Whitecow-Warneke complex, 8 to 35 percent slopes
584F	Whitecow-Whitecow, stony-Warneke complex, 25 to 60 percent slopes
585E	Whitecow, bouldery-Shawmut, very bouldery-Rock outcrop complex, 15 to 45 percent slopes
591F	Windham-Rock outcrop-Warneke complex, 35 to 60 percent slopes
631D	Rencot-Rock outcrop-Rencot, stony, complex, 8 to 25 percent slopes
631E	Rencot-Rencot, very stony-Rock outcrop complex, 25 to 60 percent slopes
631F	Rencot-Bronec-Rock outcrop complex, 35 to 70 percent slopes
632C	Rencot-Lahood-Rock outcrop complex, 2 to 8 percent slopes
632D	Rencot-Lahood-Rock outcrop complex, 8 to 25 percent slopes
632E	Rencot, very stony-Lahood, stony-Rock outcrop complex, 25 to 45 percent slopes
633D	Rencot, very stony-Bronec, very stony-Rock outcrop complex, 4 to 25 percent slopes
634E	Rencot, very stony-Rock outcrop-Bronec, very stony, complex, 25 to 45 percent slopes
641C	Varney gravelly loam, 2 to 8 percent slopes
642C	Varney clay loam, 2 to 8 percent slopes
642D	Varney clay loam, 8 to 15 percent slopes
643A	Varney cobbly loam, 0 to 2 percent slopes
643C	Varney cobbly loam, 2 to 8 percent slopes
644C	Varney complex, 2 to 15 percent slopes, gullied
645B	Varney-Sieben complex, 1 to 4 percent slopes, stony
645D	Varney, stony-Sieben, very stony, complex, 4 to 15 percent slopes
645E	Varney, stony-Sieben, very stony, complex, 15 to 35 percent slopes
646C	Varney loam, 2 to 8 percent slopes, stony
651C	Judell gravelly loam, 2 to 8 percent slopes
652C	Judell cobbly loam, 2 to 8 percent slopes
655C	Judell gravelly loam, 2 to 8 percent slopes, warm
662B	Judell gravelly loam, 1 to 4 percent slopes, very stony
691A	Meadowcreek, Clunton, and Cardwell soils, 0 to 2 percent slopes, channeled
692A	Meadowcreek-Nestley-Riverrun complex, 0 to 2 percent slopes
713E	Raghorn-Ethridge-Kalsted complex, 15 to 35 percent slopes
713F	Raghorn-Ethridge-Kalsted complex, 35 to 70 percent slopes
721E	Zbart-Bondoe-Brocko complex, 4 to 25 percent slopes
731C	Martinsdale, stony-Martinsdale-Hilger complex, 2 to 8 percent slopes
732D	Martinsdale-Shawmut, stony-Martinsdale, bouldery, complex, 4 to 25 percent slopes
734D	Martinsdale loam, 4 to 15 percent slopes, very stony
735C	Martinsdale-Absarook-Whitlash complex, 2 to 8 percent slopes, stony
736C	Martinsdale-Work complex, 2 to 8 percent slopes
742E	Shawmut, stony-Martinsdale, very stony, complex, 4 to 25 percent slopes
744E	Shawmut, bouldery-Shawmut, stony-Tolbert, bouldery, complex, 15 to 35 percent slopes
745D	Shawmut-Wickes-Gnojek complex, 2 to 15 percent slopes, bouldery
745E	Shawmut, bouldery-Shawmut, very bouldery-Tolbert, bouldery, complex, 15 to 45 percent slopes, dry
746E	Shawmut-Tolbert complex, 8 to 35 percent slopes
747E	Shawmut, stony-Tolbert, very stony, complex, 15 to 35 percent slopes
748E	Shawmut, stony-Wickes, very stony, complex, 15 to 45 percent slopes
751C	Sixbeacon gravelly sandy loam, 2 to 8 percent slopes
752B	Sixbeacon-Vendome complex, 1 to 4 percent slopes
753C	Sixbeacon-Cozberg complex, 2 to 8 percent slopes
754D	Sixbeacon-Cozberg, stony, complex, 4 to 15 percent slopes
755A	Vendome very cobbly loam, 0 to 4 percent slopes, very stony
773F	Rock outcrop-Pensore association, 15 to 60 percent slopes
774F	Rock outcrop-Whitlash, bouldery, association, 35 to 70 percent slopes
775F	Rock outcrop-Lap-Lap, very stony, association, 15 to 70 percent slopes
776D	Rock outcrop-Devilfence association, 2 to 25 percent slopes
777E	Rock outcrop-Clugulch-Bobowic complex, 15 to 35 percent slopes
777F	Rock outcrop-Clugulch-Bobowic complex, 35 to 70 percent slopes
778E	Rock outcrop-Kounter, very bouldery-Jeffcity, bouldery, complex, 15 to 45 percent slopes
781A	Vendome sandy loam, 0 to 8 percent slopes
782A	Vendome sandy loam, 0 to 8 percent slopes, stony
791C	Chinook sandy clay loam, 2 to 8 percent slopes, saline
811C	Ethridge, saline-Zatony clay loams, 2 to 8 percent slopes
821C	Rothiemay loam, 2 to 8 percent slopes
831E	Shoddy-Cabbart-Kobarter complex, 4 to 25 percent slopes
832E	Shoddy-Rock outcrop-Delpoint complex, 2 to 25 percent slopes
841A	Clunton loam, 0 to 2 percent slopes
851D	Walbert-Shoddy-Cabbart complex, 2 to 15 percent slopes
851F	Walbert-Shoddy-Cabbart complex, 15 to 35 percent slopes
852C	Walbert sandy clay loam, 4 to 15 percent slopes
858E	Yetull-Yetull, stony, complex, 8 to 35 percent slopes
859C	Yetull loamy fine sand, 2 to 8 percent slopes
872E	Kobarter-Abor, stony, complex, 15 to 35 percent slopes
911C	Absarook-Martinsdale, stony, complex, 2 to 8 percent slopes
915C	Quincreek channery loam, 2 to 8 percent slopes
941E	Tigeron, bouldery-Tigeron, very bouldery, complex, 15 to 45 percent slopes
942E	Tigeron extremely gravelly loam, 15 to 35 percent slopes, bouldery
943F	Tigeron, stony-Tigeron, very stony, complex, 25 to 60 percent slopes
944E	Tigeron, very bouldery-Redfern, bouldery-Rock outcrop complex, 15 to 45 percent slopes, warm
945E	Tigeron, very bouldery-Redfern, bouldery-Rock outcrop complex, 15 to 45 percent slopes, dry
946F	Tigeron, very stony-Redfern, rubbly-Rock outcrop complex, 25 to 60 percent slopes
947F	Tigeron, very stony-Redfern, rubbly-Rock outcrop complex, 25 to 60 percent slopes, dry
952F	Redfern, bouldery-Rock outcrop-Tigeron, very bouldery, complex, 25 to 60 percent slopes
953F	Redfern, rubbly-Rock outcrop-Rubble land association, 25 to 60 percent slopes
954F	Redfern, rubbly-Rock outcrop-Tigeron, very bouldery, complex, 35 to 70 percent slopes
963E	Elve-Warwood complex, 15 to 45 percent slopes, stony
964E	Elve, very stony-Elve, rubbly-Cowood, rubbly, complex, 15 to 35 percent slopes
964F	Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes, cool
965E	Elve, very stony-Cowood, rubbly, complex, 15 to 35 percent slopes
965F	Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes, dry
966E	Elve, very stony-Rock outcrop-Rubble land complex, 8 to 35 percent slopes
967F	Elve, very stony-Cowood, rubbly-Rock outcrop complex, 35 to 60 percent slopes
968E	Elve, stony-Worock complex, 15 to 35 percent slopes
968F	Elve, stony-Worock complex, 35 to 60 percent slopes
969F	Elve, bouldery-Worock-Rock outcrop complex, 35 to 60 percent slopes
971F	Cowood, rubbly-Rock outcrop association, 25 to 60 percent slopes
972F	Cowood, very bouldery-Kimpton, very bouldery-Rock outcrop complex, 15 to 45 percent slopes

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

JEFFERSON COUNTY AREA AND PART OF SILVER BOW COUNTY, MONTANA

UNITED STATES DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT
MONTANA AGRICULTURAL EXPERIMENT STATION

SOIL LEGEND

Map symbols consist of numbers, letters, or a combination of numbers and letters. In the symbols that consist of a combination of numbers and letters, such as 20C or 1823F, the number designates the type of soil and the letter identifies a slope class. Numerical symbols that do not include a letter for slope class are for miscellaneous areas.

SYMBOL	NAME
973D	Cowood, very stony-Elve, very stony-Rock outcrop complex, 4 to 25 percent slopes
982F	Kimpton, very bouldery-Rock outcrop-Tiban, very bouldery, complex, 25 to 50 percent slopes
991E	Libeg loam, 15 to 35 percent slopes, bouldery
992E	Libeg, very bouldery-Libeg, bouldery-Nieman, bouldery, complex, 15 to 45 percent slopes
993D	Ratiopeak-Tiban gravelly loams, 4 to 15 percent slopes, bouldery
994E	Libeg, stony-Nieman, bouldery, complex, 15 to 45 percent slopes
996D	Libeg-Monaberg gravelly loams, 2 to 15 percent slopes, bouldery
997E	Libeg, stony-Monaberg-Adel complex, 15 to 35 percent slopes
998E	Libeg-Nieman, stony, complex, 8 to 25 percent slopes
999E	Libeg, very stony-Libeg, very bouldery, complex, 4 to 25 percent slopes
999F	Libeg, very stony-Libeg, rubbly, association, 25 to 60 percent slopes
1003E	Tiban, bouldery-Cheadle, very bouldery, complex, 15 to 35 percent slopes
1004E	Tiban, rubbly-Tiban, very bouldery-Rock outcrop complex, 15 to 45 percent slopes
1101E	Monaberg, stony-Libeg, bouldery, complex, 15 to 35 percent slopes
1102B	Adel-Libeg, stony, complex, 1 to 4 percent slopes
1103D	Adel-Libeg complex, 4 to 15 percent slopes, stony
1104C	Adel loam, 2 to 8 percent slopes
1120E	Quaint channery loam, 8 to 35 percent slopes, very stony
1121E	Quaint-Rock outcrop-Redfist complex, 4 to 25 percent slopes
1121F	Quaint-Rock outcrop complex, 15 to 45 percent slopes
1122D	Quaint-Redfist channery loams, 4 to 15 percent slopes
1131C	Redfist-Quaint channery loams, 2 to 8 percent slopes
1131D	Redfist-Quaint channery loams, 8 to 15 percent slopes
1132D	Redfist, bouldery-Perma, bouldery-Rock outcrop complex, 2 to 35 percent slopes
1141D	Devilfence very channery loam, 4 to 15 percent slopes
1142E	Devilfence-Rock outcrop-Wilspring complex, 8 to 35 percent slopes
1142F	Devilfence-Rock outcrop complex, 35 to 60 percent slopes
1143F	Deville-Wilde-Rock outcrop complex, 25 to 60 percent slopes
1146E	Deville-Rock outcrop-Wilde complex, 8 to 35 percent slopes
1152D	Wilspring-Devilfence complex, 4 to 15 percent slopes
1152E	Wilspring-Devilfence-Rock outcrop complex, 15 to 35 percent slopes
1153C	Wilspring-Quincreek-Devilfence complex, 2 to 8 percent slopes
1154E	Wilde-Deville-Vigilante complex, 8 to 35 percent slopes
1154F	Wilde, stony-Vigilante-Deville, very stony, complex, 35 to 70 percent slopes
1161E	Yreka, bouldery-Hoyt, bouldery-Shaboom, very bouldery, complex, 15 to 45 percent slopes
1162E	Yreka very cobbly loam, 15 to 35 percent slopes, bouldery
1163F	Ymark, very bouldery-Elmark, very bouldery-Rock outcrop complex, 25 to 60 percent slopes
1164F	Yreka-Brickner, stony, complex, 35 to 70 percent slopes
1170E	Whitlash-Whitlash, stony-Rock outcrop complex, 15 to 35 percent slopes
1171F	Castner, bouldery-Rock outcrop complex, 25 to 50 percent slopes
1172F	Castner, very bouldery-Rock outcrop complex, 35 to 60 percent slopes
1180E	Farnuf loam, 15 to 35 percent slopes, stony
1182C	Breeton gravelly loam, 2 to 8 percent slopes
1191E	Silverchief very cobbly clay loam, 8 to 35 percent slopes, bouldery
1210C	Ferball clay loam, 2 to 8 percent slopes
1222C	Martinsdale-Martinsdale, stony-Shawmut complex, 2 to 8 percent slopes
1222E	Martinsdale-Martinsdale, stony-Shawmut complex, 15 to 35 percent slopes
1223D	Martinsdale-Shawmut complex, 2 to 15 percent slopes, bouldery
1242D	Baxton-Connieo, very bouldery-Rock outcrop complex, 4 to 15 percent slopes, moist
1242E	Baxton-Connieo, very bouldery-Rock outcrop complex, 15 to 35 percent slopes, moist
1243D	Baxton-Connieo coarse sandy loams, 4 to 15 percent slopes, bouldery
1244D	Baxton-Connieo, very bouldery-Rock outcrop complex, 4 to 15 percent slopes
1244E	Baxton-Connieo-Rock outcrop complex, 15 to 35 percent slopes
1245E	Baxton-Breeton-Connieo complex, 15 to 35 percent slopes
1246E	Baxton, stony-Breeton, bouldery-Catgulch, very stony, complex, 15 to 35 percent slopes
1247E	Baxton-Kellygulch-Connieo complex, 15 to 45 percent slopes
1250C	Work cobbly clay loam, 2 to 8 percent slopes, stony
1250E	Work very cobbly clay loam, 8 to 25 percent slopes
1271D	Placerton-Farnuf-Connieo complex, 8 to 15 percent slopes
1272D	Placerton-Connieo-Jeffcity complex, 4 to 15 percent slopes
1273E	Placerton-Farnuf-Breeton complex, 15 to 35 percent slopes
1275D	Placerton-Farnuf-Connieo gravelly sandy clay loams, 8 to 15 percent slopes
1275E	Placerton-Farnuf-Connieo complex, 15 to 35 percent slopes
1276D	Placerton-Connieo-Jeffcity complex, 4 to 15 percent slopes, warm
1277C	Placerton-Jeffcity complex, 2 to 8 percent slopes
1280D	Crackerville-Catgulch complex, 2 to 15 percent slopes, bouldery
1281D	Crackerville-Catgulch, bouldery-Rock outcrop complex, 8 to 25 percent slopes
1282D	Crackerville-Bielenberg-Catgulch, bouldery, complex, 8 to 20 percent slopes
1283E	Crackerville-Bielenberg-Catgulch, bouldery, complex, 20 to 35 percent slopes
1286E	Crackerville-Bielenberg-Catgulch, bouldery, complex, 15 to 35 percent slopes, warm
1287E	Clancy, very stony-Crampton, bouldery-Bielenberg, very stony, complex, 15 to 45 percent slopes
1321B	Beaverell, very stony-Beaverell-Sieberell, stony, complex, 1 to 4 percent slopes
1321D	Beaverell, very stony-Sieberell, stony, complex, 4 to 15 percent slopes
1322D	Beaverell, stony-Beaverell, rubbly-Sieberell, stony, complex, 2 to 15 percent slopes
1331A	Bonebasin-Wetsand complex, 0 to 2 percent slopes
1341D	Windham very gravelly loam, 2 to 15 percent slopes, very stony
1342E	Windham-Lap very cobbly loams, 15 to 45 percent slopes, bouldery
1343D	Windham-Judell very cobbly loams, 4 to 15 percent slopes, bouldery
1351D	Perma stony loam, 2 to 15 percent slopes, very bouldery
1352E	Perma-Whitlash complex, 15 to 35 percent slopes, bouldery, warm
1353F	Perma, very stony-Whitlash, very stony-Rock outcrop complex, 15 to 45 percent slopes
1355D	Wimper-Wimper, stony, complex, 4 to 15 percent slopes, warm
1355E	Wimper-Wimper, stony, complex, 15 to 35 percent slopes, warm
1356E	Wimper gravelly loam, 8 to 35 percent slopes, stony, moist
1357F	Perma, very bouldery-Shaboom, extremely bouldery-Rock outcrop complex, 35 to 60 percent slopes
1361E	Lumpgulch, bouldery-Rock outcrop-Elmark, bouldery, complex, 8 to 35 percent slopes
1362F	Lumpgulch, bouldery-Rock outcrop complex, 25 to 60 percent slopes
1372D	Burtoner-Connieo, bouldery-Rock outcrop complex, 4 to 15 percent slopes
1373E	Burtoner-Elmark-Connieo complex, 8 to 25 percent slopes, very bouldery
1374D	Burtoner-Clancy-Connieo complex, 4 to 15 percent slopes
1375D	Burtoner-Connieo, bouldery-Rock outcrop complex, 4 to 15 percent slopes, warm
1375E	Burtoner, very stony-Connieo, bouldery-Rock outcrop complex, 15 to 45 percent slopes
1376F	Burtoner, very stony-Connieo, very stony-Rock outcrop complex, 15 to 60 percent slopes
1377E	Burtoner, very stony-Crampton, bouldery-Catgulch, bouldery, complex, 15 to 45 percent slopes
1378E	Burtoner-Elmark-Shaboom, very bouldery, complex, 15 to 45 percent slopes

SYMBOL	NAME
1381D	Jeffcity, stony-Connieo, stony-Rock outcrop complex, 2 to 15 percent slopes
1391B	Bronec fine sandy loam, 1 to 4 percent slopes
1451F	Blaincreek, very stony-Sawicki, very stony-Tolbert, very bouldery, complex, 35 to 70 percent slopes
1460C	Clasoil loam, 2 to 8 percent slopes
1461D	Bielenberg-Burtoner, very stony-Catgulch, bouldery, complex, 8 to 25 percent slopes
1540F	Shaboom, extremely bouldery-Rock outcrop-Elmark, very bouldery, association, 35 to 60 percent slopes
1541E	Shaboom, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes
1542E	Shaboom, very bouldery-Rock outcrop-Kellygulch, very bouldery, complex, 8 to 35 percent slopes
1543E	Shaboom, very bouldery-Kellygulch, very bouldery-Rock outcrop complex, 15 to 35 percent slopes
1543F	Shaboom, extremely bouldery-Kellygulch, extremely bouldery-Rock outcrop complex, 35 to 60 percent slopes
1544E	Shaboom, bouldery-Kellygulch, bouldery-Rock outcrop complex, 8 to 45 percent slopes
1563D	Hilger, rubbly-Hilger complex, 8 to 25 percent slopes
1564E	Hilger, very stony-Hilger, rubbly-Rock outcrop complex, 8 to 35 percent slopes
1591E	Catgulch, bouldery-Crackerville-Rock outcrop complex, 15 to 45 percent slopes
1595E	Connieo, bouldery-Crackerville-Rock outcrop complex, 15 to 45 percent slopes
1596C	Connieo-Rock outcrop-Placerton complex, 2 to 8 percent slopes
1602C	Farnuf-Placerton sandy clay loams, 2 to 8 percent slopes
1603C	Farnuf sandy loam, 2 to 8 percent slopes
1604D	Farnuf-Farnuf, stony-Burtoner complex, 4 to 15 percent slopes
1605C	Farnuf-Placerton sandy clay loams, 2 to 8 percent slopes, warm
1606D	Farnuf loam, 2 to 15 percent slopes
1607D	Farnuf-Placerton-Martinsdale complex, 4 to 15 percent slopes
1621D	Connieo, stony-Baxton, stony-Rock outcrop complex, 2 to 15 percent slopes
1621E	Connieo, very stony-Baxton, stony-Rock outcrop complex, 15 to 35 percent slopes
1622D	Connieo, moist-Rock outcrop complex, 2 to 15 percent slopes
1623D	Connieo-Burtoner complex, 2 to 15 percent slopes
1623E	Connieo-Baxton-Rock outcrop complex, 15 to 35 percent slopes
1624F	Connieo, very stony-Baxton, bouldery-Rock outcrop complex, 35 to 60 percent slopes
1625F	Connieo, extremely bouldery-Rock outcrop-Burtoner, extremely stony, complex, 35 to 60 percent slopes
1626D	Connieo, bouldery-Burtoner, bouldery-Rock outcrop complex, 4 to 15 percent slopes
1627E	Connieo, very bouldery-Burtoner-Rock outcrop complex, 8 to 35 percent slopes, moist
1628D	Connieo, bouldery-Ashbray, very bouldery-Rock outcrop complex, 2 to 15 percent slopes
1629C	Connieo-Catgulch-Rock outcrop complex, 2 to 8 percent slopes
1640D	Nieman, very stony-Rock outcrop-Libeg, stony, complex, 2 to 15 percent slopes
1641E	Nieman, very stony-Rock outcrop-Libeg, bouldery, complex, 15 to 45 percent slopes
1641F	Nieman, very stony-Rock outcrop-Libeg, very stony, complex, 45 to 70 percent slopes
1642F	Nieman, bouldery-Rock outcrop-Libeg, very bouldery, complex, 25 to 60 percent slopes
1643E	Nieman, stony-Libeg complex, 15 to 35 percent slopes
1643F	Nieman, stony-Libeg-Rock outcrop complex, 35 to 60 percent slopes
1651C	Sawbuck-Sawbuck, very stony-Clasoil complex, 2 to 8 percent slopes
1652E	Sawicki-Clasoil complex, 8 to 35 percent slopes, bouldery
1654E	Sawicki, stony-Blaincreek-Tolbert, very stony, complex, 15 to 45 percent slopes
1655E	Sawicki-Clasoil complex, 8 to 35 percent slopes, bouldery, warm
1656E	Sawicki-Bielenberg, very stony-Tolbert, very stony, complex, 15 to 45 percent slopes
1657E	Sawicki, very bouldery-Crampton, bouldery-Catgulch, bouldery, complex, 15 to 45 percent slopes
1658D	Sawicki, stony-Blaincreek, very stony, complex, 4 to 15 percent slopes
1658E	Sawicki, very stony-Blaincreek, very stony-Tolbert, bouldery, complex, 15 to 45 percent slopes
1659E	Sawbuck, stony-Sawbuck, bouldery, complex, 8 to 35 percent slopes
1661D	Catgulch-Baxton complex, 2 to 15 percent slopes, stony
1661E	Catgulch-Baxton complex, 15 to 35 percent slopes, stony
1662D	Catgulch, very stony-Rock outcrop-Burtoner complex, 4 to 15 percent slopes
1663D	Catgulch, bouldery-Burtoner, bouldery-Rock outcrop complex, 2 to 15 percent slopes
1664E	Catgulch, bouldery-Rock outcrop-Ashbray, bouldery, complex, 4 to 35 percent slopes
1665F	Catgulch, very bouldery-Rock outcrop-Connieo, very stony, complex, 35 to 60 percent slopes
1667E	Catgulch, extremely bouldery-Baxton, extremely bouldery-Burtoner, bouldery, complex, 15 to 35 percent slopes
1671E	Tolbert-Blaincreek complex, 8 to 35 percent slopes, warm
1672E	Tolbert-Blaincreek complex, 8 to 35 percent slopes
1675E	Tolbert, very stony-Blaincreek, stony-Rock outcrop complex, 8 to 35 percent slopes
1675F	Tolbert, very stony-Rock outcrop-Blaincreek, very stony, complex, 35 to 60 percent slopes
1680D	Raynesford silt loam, 8 to 25 percent slopes
1690F	Cheadle, very stony-Rock outcrop-Tiban, bouldery, complex, 15 to 45 percent slopes
1721C	Martinsdale loam, 2 to 8 percent slopes, warm
1722C	Martinsdale-Martinsdale, stony-Shawmut complex, 2 to 8 percent slopes, warm
1722E	Martinsdale-Martinsdale, stony-Shawmut complex, 15 to 35 percent slopes, warm
1723D	Martinsdale-Shawmut complex, 2 to 15 percent slopes, bouldery, warm
1724D	Martinsdale-Shawmut, stony-Martinsdale, bouldery, complex, 4 to 25 percent slopes, warm
1731E	Tepecreek, bouldery-Caseypeak, very bouldery-Rock outcrop complex, 8 to 35 percent slopes
1731F	Tepecreek, very bouldery-Caseypeak, rubbly-Rock outcrop complex, 35 to 60 percent slopes
1732F	Tepecreek, very bouldery-Caseypeak, very bouldery-Rock outcrop complex, 35 to 60 percent slopes
1734F	Hiore, stony-Kurrie, stony-Caseypeak, very stony, complex, 35 to 60 percent slopes
1735E	Tepecreek, stony-Caseypeak, very bouldery-Rock outcrop complex, 15 to 35 percent slopes
1735F	Tepecreek, stony-Caseypeak, very stony-Rock outcrop complex, 35 to 60 percent slopes
1740E	Tropal, bouldery-Hanson, stony-Rock outcrop complex, 8 to 25 percent slopes
1741F	Tropal, bouldery-Rock outcrop-Whitore, bouldery, complex, 15 to 45 percent slopes
1742F	Tropal, very bouldery-Rock outcrop complex, 25 to 60 percent slopes
1750F	Whitore, bouldery-Tropal, very bouldery-Rock outcrop complex, 25 to 45 percent slopes
1751F	Whitore, very stony-Tropal, very bouldery-Rock outcrop complex, 15 to 45 percent slopes
1752E	Whitore, stony-Helmville, bouldery-Firada, very stony, complex, 15 to 45 percent slopes
1753E	Whitore, stony-Tropal, very stony-Firada, very stony, complex, 8 to 35 percent slopes
1760E	Hanson, stony-Whitore, bouldery, complex, 8 to 35 percent slopes
1770E	Helmville, rubbly-Tiban, very bouldery-Rock outcrop complex, 15 to 45 percent slopes
1781E	Firada, stony-Tropal, very stony-Rock outcrop complex, 4 to 25 percent slopes
1790F	Sigbird, very bouldery-Sigbird, stony-Rock outcrop complex, 25 to 70 percent slopes
1800D	Breeton coarse sandy loam, 4 to 15 percent slopes
1802D	Breeton-Baxton-Connieo complex, 4 to 15 percent slopes
1803C	Breeton-Cometcrik complex, 2 to 8 percent slopes
1810F	Hoyt, very stony-Ymark, bouldery-Shaboom, very bouldery, complex, 25 to 60 percent slopes
1821F	Kellygulch, bouldery-Rock outcrop-Bielenberg complex, 35 to 70 percent slopes
1822F	Kellygulch, stony-Shaboom, very bouldery-Rock outcrop association, 45 to 75 percent slopes

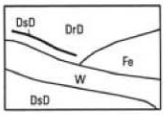
SYMBOL	NAME
1823E	Kellygulch, stony-Shaboom, very bouldery-Rock outcrop complex, 15 to 35 percent slopes
1823F	Kellygulch, stony-Shaboom, very bouldery-Rock outcrop complex, 35 to 60 percent slopes
1830E	Clancy-Bielenberg-Breeton complex, 15 to 35 percent slopes
1831D	Clancy-Burtoner, bouldery, complex, 4 to 15 percent slopes
1832D	Clancy-Burtoner, bouldery-Rock outcrop complex, 4 to 15 percent slopes
1833D	Clancy-Connieo complex, 2 to 15 percent slopes
1835D	Clancy-Bielenberg-Connieo complex, 4 to 15 percent slopes
1836E	Clancy, bouldery-Bielenberg, stony-Catgulch, bouldery, complex, 15 to 45 percent slopes
1837E	Clancy-Bielenberg-Connieo complex, 15 to 35 percent slopes
1838D	Clancy-Clancy, very stony-Bielenberg complex, 4 to 15 percent slopes
1841D	Tuggle-Branham-Rock outcrop complex, 2 to 15 percent slopes
1842D	Caseypeak-Branham-Rock outcrop complex, 2 to 15 percent slopes
1842E	Caseypeak-Branham-Rock outcrop complex, 15 to 35 percent slopes
1842F	Caseypeak, bouldery-Branham, bouldery-Rock outcrop complex, 35 to 60 percent slopes
1851D	Branham-Lowder loams, 0 to 8 percent slopes
1851E	Branham-Lowder loams, 8 to 25 percent slopes
1853D	Branham-Tuggle complex, 2 to 15 percent slopes
1853E	Branham-Tuggle complex, 15 to 35 percent slopes
1861F	Clugulch-Bobowic-Rock outcrop complex, 35 to 70 percent slopes
1871E	Hiore, stony-Rock outcrop complex, 15 to 35 percent slopes
1871F	Hiore, stony-Rock outcrop complex, 35 to 70 percent slopes
1872E	Hiore-Clugulch-Rock outcrop complex, 15 to 35 percent slopes
1872F	Hiore-Clugulch-Rock outcrop complex, 35 to 70 percent slopes
1901F	Warwood-Tigeron, very stony-Cowood, very stony, complex, 25 to 60 percent slopes
1902D	Warwood, very bouldery-Warwood, very stony-Tigeron, very bouldery, complex, 2 to 15 percent slopes
1910F	Elmark, very bouldery-Rock outcrop-Shaboom, extremely bouldery, complex, 25 to 60 percent slopes
1921D	Judell-Lap, very stony, complex, 4 to 15 percent slopes
1921E	Judell-Lap, very stony, complex, 15 to 35 percent slopes
1930E	Elmark-Kellygulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes
1933E	Elmark, bouldery-Breeton-Shaboom, bouldery, complex, 15 to 45 percent slopes
1940E	Elmark, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes
1945E	Elmark, bouldery-Lumpgulch, very bouldery-Rock outcrop complex, 8 to 35 percent slopes, dry
1946E	Elmark, bouldery-Hoyt-Shaboom, very bouldery, complex, 8 to 35 percent slopes, dry
1947E	Elmark, bouldery-Burtoner-Rock outcrop complex, 8 to 45 percent slopes
1948E	Elmark, very bouldery-Skyview, very bouldery-Rock outcrop complex, 15 to 45 percent slopes
1950F	Franconi, very bouldery-Warwood-Caseypeak, very bouldery, complex, 25 to 60 percent slopes
1960D	Lumpgulch, bouldery-Hoyt-Shaboom, very bouldery, complex, 4 to 15 percent slopes
1961E	Lumpgulch, bouldery-Hoyt-Shaboom, very bouldery, complex, 15 to 45 percent slopes
1962E	Lumpgulch, bouldery-Yreka, very bouldery-Shaboom, very bouldery, complex, 15 to 35 percent slopes
1963F	Lumpgulch, very bouldery-Rock outcrop-Kellygulch, very bouldery, complex, 25 to 60 percent slopes
1964E	Lumpgulch, very bouldery-Shaboom, very bouldery-Rock outcrop complex, 8 to 25 percent slopes
1965E	Lumpgulch, bouldery-Ymark, very bouldery-Rock outcrop complex, 15 to 45 percent slopes
1970E	Bignell, stony-Yreka, very stony, complex, 15 to 35 percent slopes
1980F	Stemple cobbly loam, 35 to 60 percent slopes, very stony
1990F	Bobowic, very bouldery-Rock outcrop-Tepecreek, very bouldery, complex, 25 to 60 percent slopes
1991D	Bobowic-Clugulch, bouldery-Rock outcrop complex, 4 to 25 percent slopes
2000E	Skyview, very bouldery-Rock outcrop-Roegulch, very bouldery, complex, 8 to 35 percent slopes
2001E	Skyview, very bouldery-Elmark, very bouldery-Rock outcrop complex, 15 to 45 percent slopes
2011D	Shawmut gravelly loam, 4 to 15 percent slopes, bouldery, warm
2012D	Shawmut, stony-Martinsdale, very stony, complex, 4 to 15 percent slopes, warm
2012E	Shawmut, stony-Martinsdale, very stony, complex, 15 to 25 percent slopes, warm
2013E	Shawmut, bouldery-Wickes, stony-Tolbert, bouldery, complex, 15 to 35 percent slopes
2014E	Shawmut-Tolbert complex, 8 to 35 percent slopes, warm
2020D	Shawmut, stony-Shawmut, bouldery, complex, 4 to 15 percent slopes
2030E	Kokoruda-Elmark, very bouldery-Rock outcrop complex, 8 to 35 percent slopes
2031D	Eagleton, stony-Kokoruda-Cometcrik complex, 2 to 25 percent slopes
2040F	Shaboom, extremely bouldery-Rock outcrop-Rubble land association, 35 to 70 percent slopes
2041F	Rock outcrop-Catgulch, bouldery, complex, 15 to 70 percent slopes
2042F	Rock outcrop-Cheadle, very bouldery-Tiban, very bouldery, complex, 15 to 50 percent slopes
2043F	Rencot, very stony-Rencot, bouldery-Rock outcrop association, 15 to 60 percent slopes
2045F	Caseypeak, very stony-Rock outcrop-Rubble land association, 15 to 60 percent slopes, dry
2046F	Caseypeak, very bouldery-Rock outcrop-Rubble land association, 15 to 60 percent slopes, cool
2051E	Opitz, bouldery-Branham, very bouldery-Tuggle, very bouldery, complex, 8 to 35 percent slopes
2081F	Windham, very stony-Rock outcrop-Lap, very stony, complex, 35 to 70 percent slopes, warm
2082D	Windham-Judell complex, 8 to 15 percent slopes, warm
2084E	Windham, stony-Maiden, very stony-Lap, very stony, complex, 15 to 45 percent slopes, warm
2086E	Windham-Windham, stony, complex, 15 to 35 percent slopes, warm
2088D	Windham-Judell gravelly loams, 8 to 25 percent slopes, stony, warm
2090F	Caseypeak, very bouldery-Franconi, very bouldery-Rock outcrop complex, 25 to 60 percent slopes
2091E	Caseypeak, bouldery-Franconi, bouldery-Rock outcrop complex, 8 to 35 percent slopes
2110D	Sebud very cobbly loam, 4 to 15 percent slopes, very stony
2111E	Sebud, very stony-Hapgood complex, 8 to 45 percent slopes
2112D	Sebud-Marcel complex, 4 to 25 percent slopes, bouldery
2121F	Hapgood-Hanson-Tiban complex, 25 to 60 percent slopes, very stony
2122F	Hapgood-Tiban complex, 35 to 70 percent slopes, very stony
2123F	Hapgood-Sebud-Arrowpeak complex, 15 to 60 percent slopes, very stony
2125F	Cowood, rubbly-Elve, very stony-Rock outcrop complex, 25 to 60 percent slopes
2151E	Releep, very bouldery-Kurrie, very bouldery-Rock outcrop complex, 15 to 35 percent slopes
2161E	Ellena, bouldery-Worock, very bouldery-Rock outcrop complex, 15 to 45 percent slopes
2161F	Kurrie, very bouldery-Ellena, very bouldery-Rock outcrop complex, 25 to 60 percent slopes
2171F	Hiore-Kurrie, stony, complex, 25 to 60 percent slopes
2172F	Rubick, very stony-Rock outcrop complex, 35 to 60 percent slopes
2173F	Rubick gravelly sandy loam, 35 to 60 percent slopes, stony
2181F	Repkie, very stony-Yreka, stony-Skyview, very bouldery, complex, 25 to 60 percent slopes
2211E	Sebud-Arrowpeak, stony, complex, 8 to 45 percent slopes
2211F	Sebud, very stony-Arrowpeak, very stony-Rock outcrop complex, 35 to 60 percent slopes
2212D	Sebud, very stony-Libeg-Arrowpeak, stony, complex, 4 to 15 percent slopes
2212E	Sebud, very stony-Libeg, stony-Arrowpeak, stony, complex, 15 to 35 percent slopes
2213E	Sebud, stony-Surdal, stony-Arrowpeak, very stony, complex, 8 to 35 percent slopes

SYMBOL	NAME
2213F	Sebud, stony-Surdal, stony-Arrowpeak, very stony, complex, 35 to 60 percent slopes
2214E	Sebud, bouldery-Surdal, very bouldery-Arrowpeak, very bouldery, complex, 4 to 35 percent slopes
2215D	Sebud-Tibkey cobbly loams, 2 to 15 percent slopes, bouldery
2216D	Sebud-Surdal complex, 4 to 25 percent slopes, stony
2221E	Arrowpeak, very stony-Surdal, stony-Rock outcrop complex, 8 to 35 percent slopes
2222F	Arrowpeak, very stony-Sebud, stony-Surdal, very stony, complex, 25 to 60 percent slopes
2230B	Tineman cobbly loam, 2 to 8 percent slopes, very stony
2251F	Nivean, very stony-Rock outcrop-Rubble land complex, 25 to 60 percent slopes
2252E	Nivean, very stony-Macabre, stony-Rock outcrop complex, 15 to 35 percent slopes
2261D	Lowland loam, 4 to 15 percent slopes, stony
2261E	Lowland loam, 15 to 35 percent slopes, stony
2261F	Lowland, stony-Rock outcrop-Rubble land complex, 35 to 60 percent slopes
2270F	Macabre, very stony-Rock outcrop-Rubble land complex, 35 to 60 percent slopes
2271D	Macabre gravelly loam, 8 to 15 percent slopes
2281F	Judco, stony-Torpy, stony-Rock outcrop complex, 15 to 60 percent slopes
2291F	Mocmont-Kadygulch cobbly loams, 35 to 60 percent slopes, very stony
2301F	Mocmont, bouldery-Roegulch, rubbly-Rock outcrop complex, 25 to 60 percent slopes
2311F	Worock, stony-Cowood, very stony-Rock outcrop complex, 35 to 60 percent slopes
2312F	Worock, stony-Elve, stony-Rock outcrop complex, 35 to 60 percent slopes
2321D	Torpy loam, 4 to 15 percent slopes
2321E	Torpy gravelly loam, 15 to 35 percent slopes
2321F	Torpy gravelly loam, 35 to 60 percent slopes
2322E	Lowland-Torpy complex, 15 to 35 percent slopes
2322F	Lowland-Torpy complex, 35 to 60 percent slopes
2331B	Mooseflat loam, 1 to 4 percent slopes
2332B	Mooseflat-Elvick loams, 1 to 4 percent slopes
2350D	Clasoil, very stony-Sawicki, bouldery, complex, 4 to 15 percent slopes
2360E	Gnojek, stony-Wickes, stony-Shawmut complex, 8 to 35 percent slopes
2360F	Gnojek, stony-Wickes, stony-Rock outcrop complex, 35 to 70 percent slopes
2361E	Gnojek, stony-Wickes, stony-Rock outcrop complex, 8 to 35 percent slopes
2361F	Gnojek, stony-Rock outcrop-Wickes, stony, complex, 25 to 60 percent slopes
2391C	Marcel, very bouldery-Tibkey, bouldery, complex, 2 to 8 percent slopes
2411E	Ashbray, bouldery-Rock outcrop-Rubble land complex, 8 to 45 percent slopes
2412F	Ashbray, rubbly-Rock outcrop-Kellygulch, very stony, complex, 35 to 70 percent slopes
2421E	Surdal, stony-Arrowpeak, very stony, complex, 4 to 25 percent slopes
2431C	Foolhen, stony-Tibkey, bouldery, complex, 0 to 8 percent slopes
2441E	Tineman, very stony-Franconi, bouldery-Rock outcrop complex, 4 to 25 percent slopes
2450E	Kounter, bouldery-Rock outcrop-Cedric, bouldery, complex, 8 to 35 percent slopes
2451D	Kounter, bouldery-Rock outcrop-Cedric, bouldery, complex, 4 to 25 percent slopes, dry
2452E	Kounter, very bouldery-Rock outcrop-Jeffcity, bouldery, complex, 15 to 35 percent slopes
2460D	Cedric, bouldery-Jeffcity, bouldery-Rock outcrop complex, 2 to 15 percent slopes
2461D	Cedric, bouldery-Rock outcrop-Jeffcity, bouldery, complex, 2 to 15 percent slopes
2471F	Elve, stony-Worock, stony-Rock outcrop complex, 35 to 60 percent slopes
2472E	Elvick-Lowder complex, 8 to 25 percent slopes, very bouldery
2473E	Elve-Cowood very cobbly loams, 8 to 35 percent slopes, very stony
2481F	Brickner, very bouldery-Rock outcrop-Rubble land complex, 15 to 60 percent slopes
2483F	Elve, rubbly-Rock outcrop-Rubble land association, 15 to 60 percent slopes, cool
2484F	Rock outcrop-Rubble land-Redfern, rubbly, association, 35 to 70 percent slopes
2485F	Redfern, rubbly-Rock outcrop-Tigeron, very bouldery, association, 25 to 70 percent slopes
2486F	Elve, rubbly-Rock outcrop-Rubble land complex, 35 to 60 percent slopes
2487F	Torpy, rubbly-Rock outcrop-Rubble land complex, 35 to 60 percent slopes
2488D	Elve, very stony-Rock outcrop-Rubble land complex, 4 to 35 percent slopes
2501D	Lowder-Elvick very cobbly loams, 2 to 15 percent slopes, very bouldery
2511C	Monaberg loam, 2 to 8 percent slopes, bouldery
2581E	Worock, very bouldery-Elve, very stony, complex, 15 to 35 percent slopes
2582D	Worock-Elve very cobbly loams, 2 to 15 percent slopes, very bouldery, cool
2582E	Worock, very bouldery-Worock, rubbly, complex, 8 to 35 percent slopes
2582F	Worock, rubbly-Rock outcrop-Rubble land complex, 35 to 60 percent slopes
2583D	Worock, stony-Worock, very bouldery, complex, 2 to 15 percent slopes
2583F	Worock, very bouldery-Worock, rubbly, complex, 15 to 60 percent slopes
2584E	Worock, very bouldery-Worock, rubbly, complex, 15 to 45 percent slopes, dry
2591F	Kadygulch-Roegulch, stony, complex, 35 to 60 percent slopes
2661F	Elve-Cowood complex, 45 to 70 percent slopes
2662E	Elve-Cowood complex, 15 to 45 percent slopes
2681E	Sawbuck-Catgulch, stony, complex, 8 to 45 percent slopes
2682E	Sawbuck, stony-Yreka, stony-Catgulch, very stony, complex, 15 to 45 percent slopes
2691F	Connieo, very stony-Crackerville, stony-Rock outcrop complex, 35 to 60 percent slopes
2695E	Macabre-Nivean complex, 15 to 35 percent slopes
2695F	Macabre-Judco-Rock outcrop complex, 35 to 60 percent slopes
2701F	Crampton-Catgulch complex, 35 to 60 percent slopes, very stony
2705F	Vitroff-Torpy loams, 35 to 60 percent slopes
2711E	Libeg very gravelly loam, 15 to 45 percent slopes
2712D	Libeg-Mooseflat loams, 4 to 25 percent slopes
3001B	Aridic Ustifluvents, 0 to 4 percent slopes
3033B	Sappington-Amesha loams, 1 to 4 percent slopes
3033C	Sappington-Amesha loams, 4 to 8 percent slopes
3061E	Holter-Castner channery loams, 8 to 45 percent slopes
3064D	Windham channery loam, 4 to 15 percent slopes
3137B	Musselshell-Crago complex, 2 to 8 percent slopes
3141E	Crago-Pensore channery loams, 15 to 45 percent slopes
3218A	Meadowcreek-Fairway complex, 0 to 2 percent slopes
3233C	Geohrock-Crago very cobbly loams, 2 to 8 percent slopes
3433E	Crago-Musselshell gravelly loams, 4 to 35 percent slopes
3486F	Peeler-Rock outcrop complex, 15 to 60 percent slopes
3501B	Fluvaquents-Fluvaquentic Haplustolls complex, 0 to 4 percent slopes
3513A	Attewan-Nippt complex, 0 to 2 percent slopes
3532B	Geohrock gravelly loam, 2 to 8 percent slopes
3664E	Windham-Whitecow-Lap channery loams, 15 to 45 percent slopes
3685F	Whitecow channery loam, 25 to 60 percent slopes
3885F	Whitecow-Warneke channery loams, 15 to 45 percent slopes
DAM	Dam
M-W	Miscellaneous water
W	Water

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

SOIL SURVEY FEATURES

SOIL DELINEATIONS AND SYMBOLS



STANDARD LANDFORM AND MISCELLANEOUS SURFACE FEATURES

- Clay spot
- Closed depression
- Escarpment, bedrock
- Gravel pit
- Gravelly spot
- Marsh or swamp
- Mine or quarry
- Perennial water
- Rock outcrop
- Saline spot
- Sandy spot
- Short steep slope
- Stony spot
- Very stony spot
- Wet spot

CULTURAL FEATURES

BOUNDARIES

- County or parish
- Reservation (national or state forest or park)
- Limit of soil survey (label)
- Public land survey system section boundary

ROAD EMBLEMS & DESIGNATIONS

- Interstate
- Federal
- State

Symbol Definitions

LABEL	NAME	DESCRIPTION
	Clay spot	A spot where the surface texture is silty clay or clay in areas where the surface layer is sandy loam, loam, silt loam, or coarser.
	Depression, closed	A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and is without a natural outlet for surface drainage. Typically .5 to 5 acres.
	Escarpment, bedrock	A relatively continuous and steep slope or cliff, which was produced by erosion or faulting, that breaks the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.
	Gravel pit	An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel. Typically .5 to 5 acres.
	Gravelly spot	A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter in an area of surrounding soil with less than 15 percent fragments. Typically .5 to 2 acres.
	Marsh or swamp	A water-saturated, very poorly drained area, intermittently or permanently covered by water. Sedges, cattails, and rushes dominate marsh areas. Trees or shrubs dominate swamps. Not used in map units where the named components are poorly drained or very poorly drained. Typically .5 to 5 acres.
	Mine or quarry	An open excavation from which soil and underlying material are removed, exposing the bedrock. Also used to denote surface openings to underground mines. Typically .5 to 5 acres.
	Perennial water	Small, natural or constructed lake, pond, or pit that contains water most of the year. Typically less than 5 acres.
	Rock outcrop	An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where “Rock outcrop” is a named component of the map unit. Typically .5 to 2 acres.
	Saline spot	An area where the surface layer has an electrical conductivity (EC) of 8 mmhos cm-1 more than the surface layer of the named soils in the surrounding map unit, which have an EC of 2 mmhos cm-1 or less. Typically .5 to 2 acres.
	Sandy spot	A spot where the surface layer is loamy fine sand or coarser in areas where the surface layer of the named soils of the surrounding map unit is very fine sandy loam or finer.
	Short, steep slope	Narrow soil area that has slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.
	Stony spot	A spot where 0.01 to 0.10 percent of the surface cover is rock fragments that are greater than 10 inches in diameter in areas where the surrounding soil has no surface stones. Typically .5 to 2 acres.
	Very stony spot	A spot where 0.1 to 3.0 percent of the surface cover is rock fragments that are greater than 10 inches in diameter in areas where the surrounding soil has less than 0.01 percent of a surface cover of stones. Typically .5 to 2 acres.
	Wet spot	A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit. Typically less than 5 acres.